Attitudes Towards Chickens & Fishes: A Study Of Brazil, Canada, China, & India

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Comparing Beliefs About Fishes And Chickens & Their Relation To Animal-Positive Behaviors Across Countries

January 2022

Authors: Zach Wulderk, Sebastian Quaade, Dr. Jo Anderson, Dr. Courtney Dillard, Dr. Walter Sánchez-Suárez, and Tom Beggs, MA
Background

According to the Food and Agriculture Organization of the United Nations, nearly 69 billion chickens were slaughtered in 2018 alone. That same year, the fishes slaughtered worldwide weighed nearly 100 million tons. Many of the countries we have surveyed in this line of research—which includes Brazil, Canada, China, India, and the United States—contribute in huge quantities to the enormous suffering of chickens and fishes. For example, China, the United States, and Brazil slaughtered more chickens than any other countries in 2018, with India not far behind. In terms of tons of fishes slaughtered, China ranked first in the world, while India was fourth and the U.S. was sixth. In total, the five countries considered in this research account for over 40% of the global chicken slaughter and more than a quarter of global fish slaughter.

Across the world, advocates are working to improve the welfare of animals and to reduce the consumption of animal products. Because of cultural differences across different regions, it is important that advocates understand the context in which they are working rather than assuming that lessons from one part of the world can be applied to audiences in another. Despite the massive quantities of chicken and fish slaughter committed by each of these countries, it is not necessarily the case that their residents share similar beliefs about these animals. By comparing the country-level findings described in other sections of this report, we can observe similarities and differences in beliefs across countries. This information may be helpful for animal advocates working in an international context.

Key Findings

1. **Base rates of pro-animal behavior are higher in India, China, and Brazil than the U.S. and Canada.** Participants from the U.S. and Canada took the diet pledge and signed the welfare petition at much lower rates than participants from other countries. In Brazil, China, and India, at least half of participants were willing to take pro-animal actions.

2. **Many beliefs are consistent across countries, but important differences remain, underscoring the need for careful consideration of local contexts in animal advocacy campaigns.** Some beliefs, including “fish are beautiful,” “chickens can feel pain,” and others, were common in all countries. Other beliefs were only frequent in some countries, such as the belief that fish are loving in India and Brazil, or that many chicken farms have horrible living conditions in the U.S. and India.

3. **Even when beliefs are similar across countries, correlations between beliefs and pro-animal actions may not be.** U.S. participants’ beliefs had the strongest average associations with pro-animal actions compared to participants from other countries, while Indian participants had the weakest associations. Brazilian, Chinese, and Canadian
participants’ associations fell in between. The stronger the association between beliefs and actions, the more likely it is that advocates working to influence beliefs will have a positive effect on the behaviors we want to shift.

4. **Beliefs about fishes and about chickens were similarly associated with pro-animal actions.** In other words, beliefs may be equally important in people’s minds when deciding whether or not to take pro-animal actions, regardless of whether they are considering chickens or fishes.

**Research Team**

This project is a collaboration between researchers at Faunalytics and Mercy For Animals (MFA): namely, Zach Wulderk, Jo Anderson, and Tom Beggs of Faunalytics and Courtney Dillard, Walter Sanchez-Suarez, and Sebastian Quaade of MFA. We are indebted to Meredith Hui, Rashmit Arora, Diogo Fernandes, and Vitor Clemente for their assistance with linguistic and cultural translation, and to Cristina Mendonça, Meredith Hui, and Nikunj Sharma for their invaluable feedback.

We’d like to thank the CEA Animal Welfare Fund, the Culture and Animals Foundation, and an anonymous donor for funding this work, and the Tipping Point Private Foundation for funding the report translations.

**Study Design**

Including the [first report](#) in this line of research, we surveyed over 1,000 adults each in Brazil, Canada, China, and the U.S., and nearly 900 in India. Within each country, these participants were split into two groups and asked to provide information on their beliefs about either fishes or chickens. Respondents were then asked if they would take a diet pledge to reduce their consumption of this animal, and if they would sign a petition calling for improved living and slaughter conditions. The sole exception to this approach was China, where instead of being offered a petition, participants were asked whether they support these welfare reforms.

In addition to determining the commonality of each belief at the country level, we also calculated correlations between each belief and the pro-animal actions participants were offered—that is, taking a diet pledge or signing a welfare petition.

More information on the results for participants from each country, as well as recommendations for animal advocates, can be found in the country-specific reports.
Results

Because each of the countries we surveyed is a unique environment, comparisons between them may be limited in what they can reveal to animal advocates. Rather than performing statistical analyses on groups of people who may differ considerably in a number of ways, we have examined a handful of high-level trends that show potential similarities and differences that advocates—especially those working across borders or hoping to apply non-domestic findings—can use to inform their work. By comparing animal-positive behaviors, common beliefs, and the correlations between them across countries, we can better understand which types of messages may resonate with many populations and which may only apply to some.

Animal-Positive Behaviors

Table 1: Animal-Positive Behaviors by Country

<table>
<thead>
<tr>
<th></th>
<th>Fish Pledge</th>
<th>Fish Petition</th>
<th>Fish Support</th>
<th>Chicken Pledge</th>
<th>Chicken Petition</th>
<th>Chicken Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brazil</td>
<td>61%</td>
<td>69%</td>
<td>-</td>
<td>52%</td>
<td>70%</td>
<td>-</td>
</tr>
<tr>
<td>Canada</td>
<td>39%</td>
<td>44%</td>
<td>-</td>
<td>37%</td>
<td>47%</td>
<td>-</td>
</tr>
<tr>
<td>China</td>
<td>71%</td>
<td>-</td>
<td>97%</td>
<td>76%</td>
<td>-</td>
<td>98%</td>
</tr>
<tr>
<td>India</td>
<td>72%</td>
<td>75%</td>
<td>-</td>
<td>76%</td>
<td>72%</td>
<td>-</td>
</tr>
<tr>
<td>U.S.</td>
<td>30%</td>
<td>37%</td>
<td>-</td>
<td>31%</td>
<td>40%</td>
<td>-</td>
</tr>
</tbody>
</table>

Notes. Chinese participants were asked about their support more generally due to the unlikelihood of a petition being used in the Chinese political context.

A majority of Indian, Chinese, and Brazilian participants expressed a willingness to take pro-animal actions. Across the countries surveyed, Indian and Chinese participants consistently had the highest levels of animal-positive behavior. In India and China, more than two-thirds of participants took the diet pledges, and about three out of four Indian participants were willing to sign the welfare petitions. Over two-thirds of Brazilian participants were willing to sign the petitions, with fewer—but still a majority—willing to take the diet pledges.

Participants from Canada and the U.S. were less likely to show animal-positive behaviors than those from India, China, or Brazil. Although Canadian participants were more likely to take each action compared to U.S. participants, fewer than half of all respondents in both countries signed a petition or took a diet pledge.

Given the considerable proportions of participants who took diet pledges, advocates working in Brazil, China, and India may find a considerable amount of openness to reducing chicken and fish consumption among the general public. The same is true for advocates in Brazil and India who are seeking welfare petition signatures. Advocates in the U.S. and Canada may have a
more difficult time generating these behaviors, but could emphasize the key beliefs discussed in the respective country-level reports to get more buy-in.

**Beliefs About Fishes**

Several beliefs about fishes were consistently held across all five countries, while others were typical in some countries but atypical in others.

In each of the countries surveyed, “Fish is a good source of protein” was one of the two most commonly held beliefs. Other common beliefs include fishes’ beauty, their ability to communicate, and their ability to feel pain. Table 2 shows where each of these beliefs ranked in terms of agreement for each country surveyed.

**Table 2: Most Common Beliefs About Fishes**

<table>
<thead>
<tr>
<th>Belief</th>
<th>Brazil</th>
<th>Canada</th>
<th>China</th>
<th>India</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish is a good source of protein</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Fish are beautiful</td>
<td>2</td>
<td>2</td>
<td>8</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Fish can communicate with each other</td>
<td>5</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>4</td>
</tr>
<tr>
<td>Fish can feel pain</td>
<td>7</td>
<td>5</td>
<td>7</td>
<td>4</td>
<td>3</td>
</tr>
</tbody>
</table>

Several beliefs were consistently rare. Foremost, few participants believe that water quality is unimportant to fishes. This belief was one of the two least commonly held in every country. Other uncommon beliefs were that fish are gross, never find it stressful to be picked up or handled, don’t care for their young, and don’t care about being overcrowded. Table 3 displays the ranking of each of these beliefs in terms of agreement for each country surveyed.

**Table 3: Least Common Beliefs About Fishes**

<table>
<thead>
<tr>
<th>Belief</th>
<th>Brazil</th>
<th>Canada</th>
<th>China</th>
<th>India</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water quality isn’t that important to fish</td>
<td>34</td>
<td>33</td>
<td>35</td>
<td>33</td>
<td>33</td>
</tr>
<tr>
<td>Fish are gross</td>
<td>35</td>
<td>31</td>
<td>34</td>
<td>30</td>
<td>29</td>
</tr>
<tr>
<td>Fish never find it stressful to be picked up or handled</td>
<td>31</td>
<td>32</td>
<td>30</td>
<td>29</td>
<td>32</td>
</tr>
<tr>
<td>Fish don’t care for their young</td>
<td>32</td>
<td>27</td>
<td>29</td>
<td>31</td>
<td>28</td>
</tr>
<tr>
<td>Fish don’t care about being overcrowded</td>
<td>29</td>
<td>29</td>
<td>31</td>
<td>25</td>
<td>31</td>
</tr>
</tbody>
</table>

A few beliefs about fishes were common in some countries, but less common in others. The beliefs that “Fish need room to explore and exercise” and “Fish act mostly out of instinct” were commonly held in every country except India. In both Brazil and India, many participants believed that fish are loving, but participants from China, Canada, and the U.S. were much less likely to hold this belief.
Table 4: Beliefs with the Most Variation by Country

<table>
<thead>
<tr>
<th>Belief</th>
<th>Brazil</th>
<th>Canada</th>
<th>China</th>
<th>India</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish are loving</td>
<td>3</td>
<td>22</td>
<td>16</td>
<td>3</td>
<td>26</td>
</tr>
<tr>
<td>Fish act mostly out of instinct</td>
<td>10</td>
<td>9</td>
<td>3</td>
<td>26</td>
<td>6</td>
</tr>
<tr>
<td>Fish need room to explore and exercise</td>
<td>6</td>
<td>3</td>
<td>2</td>
<td>21</td>
<td>2</td>
</tr>
</tbody>
</table>

Beliefs About Chickens

The belief that chicken is a good source of protein was one of the two most commonly held beliefs in every country. The beliefs that chickens can feel pain, communicate with each other, feel negative emotions like fear, and feel stress were all also among the most commonly held beliefs in each country surveyed. Table 5 shows a selection of chicken beliefs that were commonly held among participants from each country and where those beliefs ranked for participants from each country.

Table 5: Most Common Beliefs About Chickens

<table>
<thead>
<tr>
<th>Belief</th>
<th>Brazil</th>
<th>Canada</th>
<th>China</th>
<th>India</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicken is a good source of protein</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Chickens can feel pain</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Chickens can communicate with each other</td>
<td>7</td>
<td>5</td>
<td>2</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Chickens can feel negative emotions like fear</td>
<td>6</td>
<td>7</td>
<td>6</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Chickens can feel stress</td>
<td>3</td>
<td>4</td>
<td>10</td>
<td>10</td>
<td>4</td>
</tr>
</tbody>
</table>

Regardless of country, the belief that chickens don’t care for their young was rare. Other uncommon beliefs include that air and water quality aren’t that important to chickens, chickens never find it stressful to be picked up or handled, chickens are gross, and chickens have no personality. Table 6 shows a selection of chicken beliefs that relatively few participants from each country agreed with.

Table 6: Least Common Beliefs About Chickens

<table>
<thead>
<tr>
<th>Belief</th>
<th>Brazil</th>
<th>Canada</th>
<th>China</th>
<th>India</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chickens don’t care for their young</td>
<td>34</td>
<td>31</td>
<td>33</td>
<td>32</td>
<td>32</td>
</tr>
<tr>
<td>Air and water quality aren’t that important to chickens</td>
<td>30</td>
<td>29</td>
<td>32</td>
<td>31</td>
<td>30</td>
</tr>
<tr>
<td>Chickens never find it stressful to be picked up or handled</td>
<td>32</td>
<td>30</td>
<td>29</td>
<td>30</td>
<td>31</td>
</tr>
<tr>
<td>Chickens are gross</td>
<td>33</td>
<td>32</td>
<td>34</td>
<td>23</td>
<td>25</td>
</tr>
<tr>
<td>Chickens have no personality</td>
<td>28</td>
<td>27</td>
<td>31</td>
<td>29</td>
<td>27</td>
</tr>
</tbody>
</table>
While there is a general consensus across countries about certain chicken-related beliefs, this is not the case for every belief we asked about. For example, “Individual chickens don’t have unique characteristics” was more common among Indian participants than it was for participants from other countries. Conversely, “Chickens need room to explore and exercise” was one of the most commonly held beliefs in every country except for India.

Even though these findings might suggest that Indian participants have lower opinions of chickens than participants from other countries do, Indian participants were also less likely to believe that chickens act mostly out of instinct than other countries were. Along with U.S. participants, they were also more likely to agree that many chicken farms have horrible living conditions compared to participants from other countries. Some possible explanations for this difference are explored in the Conclusions section.

Table 7: Beliefs with the Most Variation by Country

<table>
<thead>
<tr>
<th>Belief</th>
<th>Brazil</th>
<th>Canada</th>
<th>China</th>
<th>India</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual chickens don’t have unique characteristics</td>
<td>31</td>
<td>25</td>
<td>30</td>
<td>11</td>
<td>28</td>
</tr>
<tr>
<td>Chickens need room to explore and exercise</td>
<td>4</td>
<td>3</td>
<td>5</td>
<td>17</td>
<td>3</td>
</tr>
<tr>
<td>Chickens mostly act out of instinct</td>
<td>9</td>
<td>16</td>
<td>8</td>
<td>28</td>
<td>15</td>
</tr>
<tr>
<td>Many of the farms that produce chickens have horrible living conditions</td>
<td>20</td>
<td>15</td>
<td>22</td>
<td>8</td>
<td>8</td>
</tr>
</tbody>
</table>

Associations Between Beliefs and Actions

All of the individual beliefs about chickens and fishes can be organized into categories: consumption, emotions, intelligence, personality, social nature, suffering, and other beliefs. For example, “Chickens are more intelligent than people give them credit for” is an intelligence belief, “Many fish farms have horrible living conditions” is a suffering belief, and “Fish is a good source of protein” is a consumption belief.

In this section, we look at the average correlations between belief categories and pro-animal behavior, with the goal of providing insight into areas advocates could focus on when designing asks for their campaigns.

We can also add more context to our understanding by considering these results together with each country’s average correlation between beliefs and actions. The strength of each country’s average correlation between their beliefs and pro-animal actions can provide insight into the tractability of focusing on beliefs to encourage these actions. In other words, residents of countries with higher correlations may show a greater willingness to sign a petition or take a diet pledge when they encounter messaging emphasizing some of the beliefs discussed in this...
report when compared to residents of countries with lower correlations, where additional obstacles may prevent these actions.

**Fish Diet Pledge**

**Figure 1: Average Correlations of Beliefs with Fish Diet Pledge**

On average, participants from the U.S. had the strongest relationships between beliefs and diet pledge commitments: having pro-animal beliefs tended to go more hand-in-hand with behavior than in the other countries. Indian participants generally had the weakest associations, while those from Brazil, Canada, and China were all similar in their average correlation strength.

These results suggest that advocates working in India may not see much difference in fish diet pledge uptake based on the beliefs they highlight, while advocates working in other countries, especially the U.S., may be able to secure more commitments by leveraging beliefs.
At the category level, beliefs about fishes' emotions, personalities, and suffering frequently had the strongest average correlations with willingness to take the diet pledge. Consumption beliefs consistently had one of the weakest average correlations with the fish diet pledge, with the exception of India. However, it is worth noting that none of the categories of belief had strong correlations for Indian participants. Because pro-animal behaviors were common among Indian participants, advocates in India may not need to allocate resources to specific messages in order to secure diet pledge commitments or petition signatures.

<table>
<thead>
<tr>
<th></th>
<th>Brazil</th>
<th>Canada</th>
<th>China</th>
<th>India</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Emotions</td>
<td>Emotions</td>
<td>Emotions</td>
<td>Consumption</td>
<td>Personality</td>
</tr>
<tr>
<td>2</td>
<td>Suffering</td>
<td>Social</td>
<td>Personality</td>
<td>Suffering</td>
<td>Emotions</td>
</tr>
<tr>
<td>3</td>
<td>Personality</td>
<td>Personality</td>
<td>Social</td>
<td>Personality</td>
<td>Suffering</td>
</tr>
<tr>
<td>4</td>
<td>Intelligence</td>
<td>Intelligence</td>
<td>Other</td>
<td>Other</td>
<td>Social</td>
</tr>
<tr>
<td>5</td>
<td>Social</td>
<td>Suffering</td>
<td>Intelligence</td>
<td>Emotions</td>
<td>Intelligence</td>
</tr>
<tr>
<td>6</td>
<td>Consumption</td>
<td>Other</td>
<td>Suffering</td>
<td>Social</td>
<td>Other</td>
</tr>
<tr>
<td>7</td>
<td>Other</td>
<td>Consumption</td>
<td>Consumption</td>
<td>Intelligence</td>
<td>Consumption</td>
</tr>
</tbody>
</table>

**Table 8: Rankings of Average Belief Category Correlations with Fish Diet Pledge**
**Fish Petition Signatures**

*Figure 2: Average Correlations of Beliefs with Fish Petition*

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Notes. Chinese participants were asked about their support more generally due to the unlikelihood of a petition being used in the Chinese political context. The average correlation for this support measure was 0.05.

Participants from Canada and the U.S. had stronger average correlations between their beliefs and fish welfare petition signatures, while Brazilian and Indian participants had weaker relationships. In other words, advocates working in Canada or the U.S. may see bigger changes in the number of fish welfare petition signatures they are able to get when emphasizing fish-related beliefs compared to advocates in Brazil or India.
Table 9: Rankings of Average Belief Category Correlations with Fish Petition

<table>
<thead>
<tr>
<th></th>
<th>Brazil</th>
<th>Canada</th>
<th>India</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Emotions</td>
<td>Emotions</td>
<td>Consumption</td>
<td>Other</td>
</tr>
<tr>
<td>2</td>
<td>Suffering</td>
<td>Other</td>
<td>Personality</td>
<td>Personality</td>
</tr>
<tr>
<td>3</td>
<td>Social</td>
<td>Personality</td>
<td>Suffering</td>
<td>Emotions</td>
</tr>
<tr>
<td>4</td>
<td>Other</td>
<td>Social</td>
<td>Social</td>
<td>Suffering</td>
</tr>
<tr>
<td>5</td>
<td>Personality</td>
<td>Intelligence</td>
<td>Other</td>
<td>Intelligence</td>
</tr>
<tr>
<td>6</td>
<td>Intelligence</td>
<td>Suffering</td>
<td>Intelligence</td>
<td>Social</td>
</tr>
<tr>
<td>7</td>
<td>Consumption</td>
<td>Consumption</td>
<td>Emotions</td>
<td>Consumption</td>
</tr>
</tbody>
</table>

Notes. Chinese participants were asked about their support more generally due to the unlikelihood of a petition being used in the Chinese political context. From strongest to weakest average correlation, the belief categories for fish support among Chinese participants were Personality, Suffering, Emotions, Intelligence, Other, Social, and Consumption.

At the category level, beliefs about emotions had the strongest average correlations with fish welfare petition signatures in Brazil and Canada, but were less strongly correlated in the U.S., where “other beliefs” and personality beliefs had stronger associations. Focusing on these types of beliefs may help advocates in these countries obtain signatures on petitions to improve fish welfare. Beliefs about consumption had the weakest average correlation in each country except India, where correlations were consistently weak.
**Chicken Diet Pledge**

Figure 3: Average Correlations of Beliefs with Chicken Diet Pledge

U.S. participants had the strongest average correlation between their beliefs about chickens and their willingness to take the chicken diet pledge, followed by participants from Brazil and Canada, and then by participants from India and China. Highlighting certain beliefs about chickens when seeking diet pledge commitments may result in more success for advocates in the U.S. in particular.
Beliefs related to chickens' emotions had one of the highest average correlations with willingness to take the diet pledge in each country except India. In Canada, the U.S., and China, personality beliefs were also among the most correlated belief categories, while suffering-related beliefs had the strongest correlation in Brazil.

With the exception of India, advocates working in the surveyed countries may be able to design similar campaigns that use beliefs about chickens' emotions to reduce chicken consumption. However, advocates should also keep in mind that different individual beliefs, discussed in the country-specific reports, may have stronger associations with pro-animal behavior in certain countries.

As was the case with the fish diet pledge, Indian participants had the strongest association between beliefs related to consumption and taking the chicken diet pledge, although correlations were similar and weak across belief categories.
Chicken Petition Signatures

Figure 4: Average Correlations of Beliefs with Chicken Petition

Notes. Chinese participants were asked about their support more generally due to the unlikelihood of a petition being used in the Chinese political context. The average correlation for this support measure was 0.07.

Canadian and U.S. participants had the strongest average correlations between their beliefs about chickens and willingness to sign the chicken welfare petition while Brazilian and Indian participants had lower average correlations. Advocates in the U.S. and Canada may wish to consider emphasizing beliefs such as those related to chickens’ emotions in messaging that promotes petitions for improved chicken welfare.
Table 11: Rankings of Average Belief Category Correlations with Chicken Petition

<table>
<thead>
<tr>
<th></th>
<th>Brazil</th>
<th>Canada</th>
<th>India</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Suffering</td>
<td>Emotions</td>
<td>Other</td>
<td>Suffering</td>
</tr>
<tr>
<td>2</td>
<td>Emotions</td>
<td>Personality</td>
<td>Consumption</td>
<td>Emotions</td>
</tr>
<tr>
<td>3</td>
<td>Other</td>
<td>Suffering</td>
<td>Suffering</td>
<td>Personality</td>
</tr>
<tr>
<td>4</td>
<td>Social</td>
<td>Other</td>
<td>Personality</td>
<td>Intelligence</td>
</tr>
<tr>
<td>5</td>
<td>Personality</td>
<td>Social</td>
<td>Emotions</td>
<td>Social</td>
</tr>
<tr>
<td>6</td>
<td>Intelligence</td>
<td>Intelligence</td>
<td>Intelligence</td>
<td>Other</td>
</tr>
<tr>
<td>7</td>
<td>Consumption</td>
<td>Consumption</td>
<td>Social</td>
<td>Consumption</td>
</tr>
</tbody>
</table>

Notes. Chinese participants were asked about their support more generally due to the unlikelihood of a petition being used in the Chinese political context. From strongest to weakest average correlation, the belief categories for chicken support among Chinese participants were Emotions, Social, Personality, Intelligence, Other, Consumption, and Suffering.

Mirroring the chicken diet pledge correlations, Brazil, Canada, and the U.S. all had emotions-related among their strongest average correlations with signing the chicken petition. Advocates in these countries who are seeking signatures for petitions focused on improving the welfare of chickens may benefit from emphasizing chickens’ emotions in their messaging. In Brazil and the U.S., beliefs about chickens’ suffering had the strongest average correlation, which advocates may also wish to consider when designing campaigns. By contrast, Indian participants’ strongest associations with chicken petition signatures were with the “other beliefs” category and consumption-related beliefs. Though the average correlations in India tended to be weaker than those in other countries, beliefs about consumption consistently had one of the strongest relationships with Indian participants’ willingness to take pro-animal actions.

Conclusions

In general, advocates can expect that most people hold certain beliefs about chickens and fishes. Most people across countries believe that fish are beautiful, can communicate with each other, and feel pain. Chickens are also largely viewed as being capable of pain, communication, and negative emotions.

There are also beliefs that differ widely across countries, such as the belief that fish need room to explore and exercise, which was less common in India than in most of the countries we surveyed. Considering which beliefs a particular population holds should be a key consideration for any animal advocate.

Beliefs also have different relationships with action across countries. Participants from Canada and the U.S. had the highest average correlations between beliefs and pro-animal behavior. In
other words, people from these countries may be more likely to take animal-positive actions based on their beliefs.

**U.S.-Canada Comparison**

Beliefs may not be a critical factor for advocates to focus on in the Indian context for the reasons described above. However, for participants from Canada and the U.S., rates of animal-positive behaviors were lower than the other countries we surveyed and their average correlations were often highest. While advocates from these countries may not get as many petition signatures or diet pledges as in Brazil, China, or India, they may be able to lessen the gap by using messaging that incorporates beliefs with the strongest correlations.

Although the results from these two countries often resemble each other, advocates working on both sides of the U.S.-Canadian border should take note of some key differences. For instance, beliefs about fish suffering were more strongly correlated with commitments to reduce fish consumption in the U.S. than they were in Canada, suggesting that advocates may see higher uptake in fish diet pledges in the U.S. than in Canada even when using the same messaging. (Additional information about the strengths of correlations can be found in Tables 12-15 in the Supplementary Materials or in the country-specific reports.)

Overall, average correlations between beliefs and petition signatures were very similar among participants from the U.S. and Canada. However, Canadians’ average correlations for diet pledges are weaker than those of U.S. participants, and instead more closely resemble the correlations of Brazilian participants. This suggests that advocates may see similar uptake of petition signatures in these neighboring countries, but that the same may not be the case for diet pledges. In other words, advocates should be careful not to assume that the same strategies will always have the same results in both countries.

**What Weak Correlations Mean For Indian Advocacy**

Participants from India consistently had weaker average correlations than residents of other countries. Because about three-quarters of Indian participants were willing to take a diet pledge or sign a welfare petition, advocates working in India could consider simply asking for a commitment or signature rather than investing large portions of their resources into messaging particular beliefs.

**Welfare Petitions Versus Diet Pledges**

In each country in which the petition question was asked, fish petition signatures were more common than fish diet pledges. The same is true for chicken petition signatures and pledges, with the exception of India, where the chicken pledge was slightly more common. This overall trend suggests that people are more willing to take a few seconds to sign a petition than they are to make a broader lifestyle change. In Brazil and the U.S., average correlations were slightly
stronger between beliefs and diet pledges than petition signatures, which could mean that emphasizing beliefs would yield better results for advocates focusing on reducing chicken and fish consumption in these countries.

**Pro-Fish Actions Versus Pro-Chicken Actions**

Although pro-chicken actions had very slightly stronger average correlations than pro-fish actions in each country, these differences are probably negligible. In other words, beliefs have similar associations with actions that benefit both fishes and chickens. One exception to this is diet pledges in China, where participants had stronger associations between beliefs for the fish diet pledge than for the chicken diet pledge.

**Diet Pledge Differences**

In Brazil, reduction of chicken consumption was the pro-animal action with the least uptake by far. In Canada and the U.S., similar proportions of the participants committed to chicken and fish diet pledges. In China and India, slightly more participants were willing to take the chicken diet pledge than the fish diet pledge. These findings are just one example of why advocates working in an international context should consider cultural and dietary differences between countries when determining which campaigns they will run: openness to certain ideas may vary greatly from country to country. Differences in correlations between beliefs and pro-animal actions underscore this point by demonstrating how similar behaviors can be associated with very different beliefs.

**Barriers to Animal-Positive Behaviors**

Barriers to pro-animal actions also exist across countries and should be considered when designing advocacy campaigns. Though an imperfect measure, GDP per capita is one way of quantifying the average citizens' wealth, and is considerably higher in countries like the U.S. and Canada than in countries such as Brazil, China, and India (CIA, 2020). Correlations between beliefs and actions may be higher in wealthier countries because their populations have access to resources that may not be as common in less wealthy countries. For example, a resident of the U.S. may be able to make dietary choices based largely on their beliefs about animals because alternative protein sources are widely available. This may not be the case in all countries. Similarly, backyard chicken farming may be more common in certain countries and residents may be wary about petitions that could result in changes to the regulations around this type of practice. In other words, advocates should not only consider which messages could generate more pro-animal action, but also what barriers may exist for certain populations.

**Future Directions**

There are several directions future research on this topic could take. Researchers could explore additional countries and identify additional trends across them. Investigations about different
animals or different sets of beliefs could also be beneficial to advocates. Greater cultural context for these beliefs and how they can affect pro-animal behavior is also critical to ensure that advocates are able to be as effective as possible. On an even broader scale, the results of this research highlight the need for country-specific research in order to ensure that animal advocacy campaigns are as effective as possible.

Supplementary Materials

**Detailed Belief Category Results**

Tables 12 through 15 contain the average correlation coefficients and standard deviations between belief categories and pro-animal actions by country. The results are ordered from strongest association to weakest.

**Table 12: Detailed Rankings of Average Belief Category Correlations with Fish Diet Pledge**

<table>
<thead>
<tr>
<th>Brazil</th>
<th>Canada</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Emotions (r = 0.13, SD = 0.04)</td>
<td>Emotions (r = 0.16, SD = 0.09)</td>
</tr>
<tr>
<td>2 Suffering (r = 0.11, SD = 0.07)</td>
<td>Social (r = 0.15, SD = 0.02)</td>
</tr>
<tr>
<td>3 Personality (r = 0.11, SD = 0.06)</td>
<td>Personality (r = 0.13, SD = 0.05)</td>
</tr>
<tr>
<td>4 Intelligence (r = 0.09, SD = 0.07)</td>
<td>Intelligence (r = 0.12, SD = 0.06)</td>
</tr>
<tr>
<td>5 Social (r = 0.07, SD = 0.06)</td>
<td>Suffering (r = 0.10, SD = 0.06)</td>
</tr>
<tr>
<td>6 Consumption (r = 0.06, SD = 0.03)</td>
<td>Other (r = 0.08, SD = 0.06)</td>
</tr>
<tr>
<td>7 Other (r = 0.05, SD = 0.04)</td>
<td>Consumption (r = 0.04, SD = 0.03)</td>
</tr>
</tbody>
</table>

**Table 13: Detailed Rankings of Average Belief Category Correlations with Vegan Diet Pledge**

<table>
<thead>
<tr>
<th>China</th>
<th>India</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Emotions (r = 0.16, SD = 0.02)</td>
<td>Consumption (r = 0.07, SD = 0.05)</td>
<td>Personality (r = 0.20, SD = 0.05)</td>
</tr>
<tr>
<td>2 Personality (r = 0.15, SD = 0.10)</td>
<td>Suffering (r = 0.06, SD = 0.03)</td>
<td>Emotions (r = 0.18, SD = 0.03)</td>
</tr>
<tr>
<td>3 Social (r = 0.12, SD = 0.02)</td>
<td>Personality (r = 0.05, SD = 0.04)</td>
<td>Suffering (r = 0.17, SD = 0.07)</td>
</tr>
<tr>
<td>4 Other (r = 0.09, SD = 0.08)</td>
<td>Other (r = 0.05, SD = 0.02)</td>
<td>Social (r = 0.16, SD = 0.06)</td>
</tr>
<tr>
<td>5 Intelligence (r = 0.09, SD = 0.09)</td>
<td>Emotions (r = 0.05, SD = 0.04)</td>
<td>Intelligence (r = 0.16, SD = 0.09)</td>
</tr>
<tr>
<td>6 Suffering (r = 0.07, SD = 0.06)</td>
<td>Social (r = 0.03, SD = 0.02)</td>
<td>Other (r = 0.12, SD = 0.07)</td>
</tr>
<tr>
<td>7 Consumption (r = 0.07, SD = 0.07)</td>
<td>Intelligence (r = 0.03, SD = 0.01)</td>
<td>Consumption (r = 0.06, SD = 0.03)</td>
</tr>
</tbody>
</table>
**Table 13: Detailed Rankings of Average Belief Category Correlations with Fish Petition**

<table>
<thead>
<tr>
<th>Brazil</th>
<th>Canada</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Emotions (r = 0.09, SD = 0.04)</td>
<td>Emotions (r = 0.18, SD = 0.02)</td>
</tr>
<tr>
<td>2 Suffering (r = 0.07, SD = 0.04)</td>
<td>Other (r = 0.13, SD = 0.04)</td>
</tr>
<tr>
<td>3 Social (r = 0.06, SD = 0.02)</td>
<td>Personality (r = 0.12, SD = 0.06)</td>
</tr>
<tr>
<td>4 Other (r = 0.06, SD = 0.03)</td>
<td>Social (r = 0.11, SD = 0.09)</td>
</tr>
<tr>
<td>5 Personality (r = 0.05, SD = 0.03)</td>
<td>Intelligence (r = 0.11, SD = 0.09)</td>
</tr>
<tr>
<td>6 Intelligence (r = 0.05, SD = 0.04)</td>
<td>Suffering (r = 0.10, SD = 0.04)</td>
</tr>
<tr>
<td>7 Consumption (r = 0.05, SD = 0.04)</td>
<td>Consumption (r = 0.07, SD = 0.03)</td>
</tr>
</tbody>
</table>

**Table 14: Detailed Rankings of Average Belief Category Correlations with Chicken Diet Pledge**

<table>
<thead>
<tr>
<th>Brazil</th>
<th>Canada</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Suffering (r = 0.15, SD = 0.07)</td>
<td>Emotions (r = 0.17, SD = 0.01)</td>
</tr>
<tr>
<td>2 Emotions (r = 0.15, SD = 0.02)</td>
<td>Personality (r = 0.15, SD = 0.08)</td>
</tr>
<tr>
<td>3 Personality (r = 0.11, SD = 0.06)</td>
<td>Suffering (r = 0.12, SD = 0.06)</td>
</tr>
<tr>
<td>4 Other (r = 0.10, SD = 0.07)</td>
<td>Intelligence (r = 0.11, SD = 0.07)</td>
</tr>
<tr>
<td>5 Intelligence (r = 0.09, SD = 0.06)</td>
<td>Other (r = 0.09, SD = 0.10)</td>
</tr>
<tr>
<td>6 Social (r = 0.08, SD = 0.01)</td>
<td>Consumption (r = 0.05, SD = 0.04)</td>
</tr>
<tr>
<td>7 Consumption (r = 0.05, SD = 0.04)</td>
<td>Social (r = 0.04, SD = 0.03)</td>
</tr>
</tbody>
</table>
Table 15: Detailed Rankings of Average Belief Category Correlations with Chicken Petition

<table>
<thead>
<tr>
<th>Brazil</th>
<th>Canada</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Suffering (r = 0.12, SD = 0.04)</td>
<td>Emotions (r = 0.17, SD = 0.01)</td>
</tr>
<tr>
<td>2 Emotions (r = 0.09, SD = 0.00)</td>
<td>Personality (r = 0.16, SD = 0.04)</td>
</tr>
<tr>
<td>3 Other (r = 0.08, SD = 0.04)</td>
<td>Suffering (r = 0.14, SD = 0.04)</td>
</tr>
<tr>
<td>4 Social (r = 0.08, SD = 0.00)</td>
<td>Other (r = 0.11, SD = 0.09)</td>
</tr>
<tr>
<td>5 Personality (r = 0.05, SD = 0.03)</td>
<td>Social (r = 0.11, SD = 0.00)</td>
</tr>
<tr>
<td>6 Intelligence (r = 0.04, SD = 0.02)</td>
<td>Intelligence (r = 0.11, SD = 0.10)</td>
</tr>
<tr>
<td>7 Consumption (r = 0.02, SD = 0.01)</td>
<td>Consumption (r = 0.03, SD = 0.03)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>India</th>
<th>U.S.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Other (r = 0.08, SD = 0.07)</td>
<td>Suffering (r = 0.17, SD = 0.04)</td>
</tr>
<tr>
<td>2 Consumption (r = 0.08, SD = 0.05)</td>
<td>Emotions (r = 0.14, SD = 0.01)</td>
</tr>
<tr>
<td>3 Suffering (r = 0.05, SD = 0.04)</td>
<td>Personality (r = 0.14, SD = 0.03)</td>
</tr>
<tr>
<td>4 Personality (r = 0.05, SD = 0.02)</td>
<td>Intelligence (r = 0.12, SD = 0.07)</td>
</tr>
<tr>
<td>5 Emotions (r = 0.04, SD = 0.04)</td>
<td>Social (r = 0.10, SD = 0.01)</td>
</tr>
<tr>
<td>6 Intelligence (r = 0.03, SD = 0.02)</td>
<td>Other (r = 0.10, SD = 0.06)</td>
</tr>
<tr>
<td>7 Social (r = 0.02, SD = 0.02)</td>
<td>Consumption (r = 0.07, SD = 0.05)</td>
</tr>
</tbody>
</table>

**Distribution of Correlation Coefficients**

Figure 5 through Figure 8 show the distribution of correlations coefficients between individual beliefs and diet pledge or welfare petition uptake, with wider parts of each distribution indicating more responses at that level of correlation. The shapes in each figure reveal differences in the consistency of correlation coefficients across countries. Participants from India, for example, tended to be consistently low in the strength of correlation between their beliefs and behavior, especially when compared to participants from Canada and the U.S.
Figure 5: Distribution of Correlation Coefficients with Fish Pledge by Country

Horizontal line indicates median. Point indicates mean. Correlations are given in absolute value.
Figure 6: Distribution of Correlation Coefficients with Fish Petition by Country

Horizontal line indicates median. Point indicates mean. Correlations are given in absolute value.
Figure 7: Distribution of Correlation Coefficients with Chicken Pledge by Country

Horizontal line indicates median. Point indicates mean. Correlations are given in absolute value.
Figure 8: Distribution of Correlation Coefficients with Chicken Petition by Country

Horizontal line indicates median. Point indicates mean. Correlations are given in absolute value.
Beliefs About Fishes and Chickens & Their Relation to Animal-Positive Behaviors in Brazil

January 2022

Authors: Zach Wulderk, Sebastian Quaade, Dr. Jo Anderson, Dr. Courtney Dillard, Dr. Walter Sánchez-Suárez, and Tom Beggs, MA
Background

Animals raised for food generally receive significantly less attention and funding than companion animals (Faunalytics, 2019). In Brazil, as in most countries, small-bodied animals like chickens and fish are killed in particularly massive numbers: over six billion chickens and over 700,000 tonnes of fishes were slaughtered in Brazil in 2018 alone (Faunalytics, 2020). The Brazilian government has enacted a number of progressive protections for domesticated and wild animals, but has not passed legislation that lays out protections specific to egg-laying hens, broiler chickens, or fishes raised for food (World Animal Protection, 2020). As a result of the lack of detailed regulations, Brazil receives a “D” grade for its protection of animals used in farming from World Animal Protection.

While a number of studies show that many Brazilians have a preference for farm production systems that give animals greater freedom, less is known about the relationship between beliefs about farmed animals and willingness to take pro-animal actions (Yunes et al, 2017; Vargas-Bello-Perez et al, 2017). This study replicates our study of U.S. beliefs about fishes and chickens to better understand which beliefs the Brazilian public has about small-bodied animals, as well as how these beliefs are related to animal-positive behaviors. Specifically, we examined the relationships between various beliefs and a willingness to reduce consumption of chickens or fishes and to sign a petition calling for improved living and slaughter conditions. Documenting these associations is a first step toward understanding beliefs and attitudes that drive pro-animal behavior in Brazil. The findings presented in this report may also prove useful to animal advocates who are seeking to target a Brazilian audience more effectively.

Key Findings

1. **About 70% of people signed a fish or chicken welfare petition.** Advocates may find that many people are willing to provide their signature for improved conditions without needing to be convinced of the initiative’s importance. People were also slightly more willing to sign a welfare petition than to pledge to reduce their fish or chicken consumption.

2. **A majority of people committed to reduce their consumption of fish or chicken, with more people taking the fish diet pledge.** More than 60% of people pledged to eat less fish and just over half pledged to eat less chicken. These findings suggest that advocates seeking dietary change may have considerable success even with limited messaging highlighting the benefits of such a change.

3. **Some pro-animal beliefs are already common, but there is room for raising awareness on other topics.** For example, large majorities recognize the importance of
air and water quality to chickens and fishes. However, less than half of people recognized that fish are capable of positive emotions, and nearly three out of four people believed that chickens act mostly out of instinct. More commonly held beliefs likely do not require more information and can be invoked as necessary, but additional advocacy focused on less commonly held beliefs could increase the frequency of pro-animal beliefs among the public.

4. Several fish-related beliefs were identified as potentially effective targets for advocates working on dietary pledges to reduce fish consumption. The beliefs that had the largest correlations with signing a pledge were that many fish farms have horrible living conditions, that fish can feel pain, and that fish can feel negative emotions like fear. The belief that fish have no personality was associated with less likelihood of taking the pledge.

5. The beliefs that had the largest correlations with fish welfare petition signatures were that fish can feel pain, that fish need room to explore and exercise, and that fish can feel positive emotions like pleasure. Advocates working on petitions for fish welfare may want to incorporate these themes in their messaging and presentation.

6. The beliefs that had the largest correlations with signing a pledge to reduce chicken consumption were that chickens need room to explore and exercise, that most chickens are raised inhumanely, that chickens can bond with humans, and that many chicken farms have horrible living conditions. Those trying to get people to reduce their consumption of chicken may wish to focus on these themes.

7. The beliefs that had the largest correlations with chicken welfare petition signatures were that chickens need room to explore and exercise and that most chickens are raised inhumanely. Advocates working on corporate campaigns may find messaging around these beliefs leads to an increase in petition signatures for chicken causes.

**Recommendations**

1. **Try messaging around the top beliefs to see if you can improve your advocacy efforts.** Based on these findings, messaging around emotions, suffering, and personality will likely lead to the best results, even outside the context of diet pledges and welfare petitions. Slightly different beliefs were also important for each animal and each outcome. Therefore, we’d suggest focusing on the strongest messages in each group of beliefs, trying them out, and keeping track of their effectiveness in order to get the best results!

2. **Don’t be afraid to ask.** These findings suggest that the Brazilian public is already fairly open to taking consumption reduction pledges and signing petitions for improved animal
welfare. You may see a significant amount of pro-animal behavior simply by asking if people would consider it.

3. **Try stacking your asks.** People were more likely to agree to sign a petition than to take a diet pledge to reduce their consumption. If you have interest in both outcomes, try asking for the petition signature first, and then go for a diet pledge after they’ve signed the petition. This may help increase diet pledges due to something known as “behavior consistency”—people generally want to be consistent in what they do, so following one successful ask with another related ask may increase uptake. Be careful to avoid overloading people with requests, though.

4. **Explore the results from other countries and check back for more recommendations as our program of research focusing on chickens and fishes continues.** We have also examined these beliefs in other countries, including the U.S., Canada, China, and India. We will also be using experimental research to provide stronger recommendations about how these beliefs can be leveraged to alter behaviors. Although we have provided preliminary recommendations in this report, an experimental comparison of the most common and strongly associated beliefs is needed to see which can be used most effectively. This research will focus on the U.S., but may have implications for future research in Brazil. Stay tuned for more from our line of research into small-bodied animals!

**Research Team**

This project is a collaboration between researchers at Faunalytics and Mercy For Animals (MFA): namely, Zach Wulderk, Jo Anderson, and Tom Beggs of Faunalytics and Courtney Dillard, Walter Sanchez-Suarez, and Sebastian Quaade of MFA. We are indebted to Meredith Hui, Rashmit Arora, Diogo Fernandes, and Vitor Clemente for their assistance with linguistic and cultural translation, and to Cristina Mendonça, Meredith Hui, and Nikunj Sharma for their invaluable feedback.

We’d like to thank the CEA Animal Welfare Fund, the Culture and Animals Foundation, and an anonymous donor for funding this work, and the Tipping Point Private Foundation for funding the report translations.

**Method Overview**

This research is a replication of Faunalytics’ 2020 report *Beliefs About Fish and Chickens & Their Relation to Animal-Positive Behaviors*, which focused on U.S. adults’ beliefs about these small-bodied animals. For this project, we explored beliefs held by adults in Brazil. We translated Faunalytics’ previous survey for use with a Brazilian audience, and confirmed with experts that the questions were culturally relevant. On the advice of cultural advisors, we added two belief questions that were not part of the U.S. survey: “Fish/Chickens are easy to raise
“yourself” and “Fish/Chickens are aggressive.” These were added to reflect potential beliefs arising from the more common experience of raising chickens at home in Brazil. We examined 7 categories of beliefs: about emotions, suffering, personality, intelligence, socialness, consuming the animal, and an “other” category. There were several beliefs in each category, meaning the full list consisted of 35 beliefs about fishes and 34 beliefs about chickens.

We surveyed 1,126 Brazilian adults and randomly assigned them to either the fish or chicken version of the survey. We then asked them to rate their level of agreement or disagreement with each of the beliefs for their assigned animal. These surveys were conducted in Brazilian Portuguese, but results will be presented in English for consistency across reports. The survey instrument can be found in its original language on Open Science Framework.

We examined two key outcome measures in order to understand how much each belief was associated with important behaviors related to the welfare of each animal: willingness to take a diet pledge and willingness to sign a welfare petition. For the diet pledge outcome, each participant was asked if they would pledge to reduce their consumption of their assigned animal. For example, participants assigned the fish condition were shown a prompt that read, “In recent years, many people have begun to reduce how much fish they eat, a pattern that is expected to continue. Will you pledge to reduce your own fish consumption?” Those who agreed were then asked to specify the amount they would limit themselves to and to provide a digital signature for their commitment.

For the petition outcome, each participant was asked if they would sign a petition to improve the welfare of their assigned animal. For example, participants in the chicken condition were shown a prompt that read, “We would like to give you the opportunity to sign a petition that would encourage legal reforms to improve the lives of farmed chickens. Specifically, the petition is designed to build support for regulations that would ensure that chickens raised on farms would have improved living and slaughter conditions. Would you be willing to sign this petition?” Participants were able to respond with “yes please” or “no thanks.”

The diet pledge and petition questions were presented at the end of the survey, where they saw a prompt reading, “Great, thank you! Before you finish, we have a couple of quick requests for you. You don’t have to agree to either, but please answer each question.” We specified that respondents’ participation incentive did not rely on them committing to the diet pledge or signing the welfare petition. The two outcome measures were counterbalanced, meaning that half of the participants saw the diet pledge first and half saw the welfare petition first.

Throughout this report, we use the plural “fishes” rather than “fish” in order to acknowledge that we are discussing a collection of individuals. Exceptions are made for English translations of survey questions, which use the plural “fish” to reflect its usage by the majority of the English-speaking public. The appropriate Brazilian Portuguese wording was used for the survey when it was administered.
All top-line descriptive statistics were calculated using data weighted to match population values for gender, age, race, and region. However, as the differences between the weighted and unweighted data were not large, inferential statistics were calculated using unweighted data to avoid introducing additional sources of variance. Additional information on participant traits can be found in the Supplementary Materials.

Results

How Many People Took the Pledge and Signed the Petition?

**Figure 1: Rates of Animal-Positive Behavior**

<table>
<thead>
<tr>
<th>Behavior</th>
<th>Fish Pledge</th>
<th>Fish Petition</th>
<th>Chicken Pledge</th>
<th>Chicken Petition</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>61%</td>
<td>69%</td>
<td>52%</td>
<td>70%</td>
</tr>
</tbody>
</table>

69% of Brazilian participants agreed to sign the fish welfare petition and slightly fewer, 61%, pledged to reduce their consumption of fish. Among the participants who pledged to reduce their consumption of fish, 10% pledged to never eat fish, 83% pledged to eat it less than once per week, and 4% pledged to eat it only 1-3 times per week.

While 70% of participants signed the chicken welfare petition, the proportion of people pledging to reduce their chicken consumption was considerably smaller at only 52%. Even though participants were less willing to take the chicken diet pledge than to sign the welfare petition, just over half of individuals took the pledge, suggesting that advocates should not be afraid to make this ask.

Of chicken pledge-takers, 4% pledged to never eat chicken, 61% pledged to eat it less than once per week, and 33% pledged to eat it only 1-3 times per week.

The Most Common Brazilian Beliefs about Fishes & Chickens

The following figures show all of the beliefs included in the study and the proportion of people who either agreed or disagreed with each, depending on which value was greater. This can give a sense of how common each of the beliefs are, which can be helpful in deciding which beliefs already exist and can be tapped into, and which beliefs need to be encouraged.
**Fishes**

**Figure 2: Beliefs About Fishes**

- Fish is a good source of protein: 95%
- Fish are beautiful: 93%
- Fish are loving: 90%
- Fish are gross: 90%
- Water quality isn't that important to fish: 89%
- Fish are the healthiest animal to eat: 87%
- Fish can communicate with each other: 85%
- Fish need room to explore and exercise: 82%
- Individual fish don't have unique characteristics: 81%
- Fish can feel pain: 78%
- Fish can feel stress: 77%
- Fish mostly act out of instinct: 76%
- Fish are curious: 76%
- Fish never find it stressful to be picked up or handled: 75%
- Fish play: 75%
- Fish don't care for their young: 74%
- Fish are contaminated with plastics, heavy metals, and chemicals: 70%
- Fish don't care about being over-crowded: 68%
- Fish are more intelligent than people give them credit for: 68%
- Fish can feel negative emotions like fear: 65%
- Big fish farms are gross: 58%
- Fish are aggressive: 58%
- Fish can learn: 58%
- Fish can bond with humans: 57%
- Fish don't mind being in a barren environment: 55%
- Fish have no personality: 52%
- If fish products are labelled "sustainable," they come from fish with good welfare: 50%
- Fish can feel positive emotions like pleasure: 47%
- Fish are the most ethical animal to eat: 47%
- Most fish people eat are caught wild in the ocean: 44%
- Most farmed fish are raised inhumane: 42%
- Eating fish doesn't contribute as much to climate change as eating other animals: 41%
- Fish are easy to raise: 41%
- Many of the farms that produce fish have horrible living conditions: 37%
- Fish have a lower IQ than most animals: 30%

Percent of respondents who agreed (or disagreed) with each of the beliefs.
**Chickens**

**Figure 3: Beliefs About Chickens**

- Chicken is a good source of protein: 91% agree, 8% disagree.
- Chickens can feel pain: 89% agree, 11% disagree.
- Chickens don’t care for their young: 87% agree, 13% disagree.
- Chickens can feel stress: 84% agree, 16% disagree.
- Chickens need room to explore and exercise: 82% agree, 18% disagree.
- Chickens are curious: 81% agree, 19% disagree.
- Chickens are gross: 80% agree, 20% disagree.
- Chickens can feel negative emotions like fear: 79% agree, 21% disagree.
- Chickens can communicate with each other: 78% agree, 22% disagree.
- Chickens never find it stressful to be picked up or handled: 78% agree, 22% disagree.
- Chickens are beautiful: 77% agree, 23% disagree.
- Air and water quality aren't that important to chickens: 75% agree, 25% disagree.
- Chickens mostly act out of instinct: 72% agree, 28% disagree.
- Individual chickens don’t have unique characteristics: 70% agree, 30% disagree.
- Chickens are loving: 66% agree, 34% disagree.
- Chicken is the healthiest animal to eat: 66% agree, 34% disagree.
- If chicken products are labelled "organic," they come from chickens with good welfare: 65% agree, 35% disagree.
- Chickens are easy to raise: 65% agree, 35% disagree.
- Most chickens are raised inhumanely: 61% agree, 39% disagree.
- Chickens can bond with humans: 60% agree, 40% disagree.
- Chickens don’t care about being over-crowded: 60% agree, 40% disagree.
- Chickens are aggressive: 60% agree, 40% disagree.
- Chickens are more intelligent than people give them credit for: 60% agree, 40% disagree.
- Chickens don’t mind being in a barren environment: 59% agree, 41% disagree.
- Chickens can learn: 59% agree, 41% disagree.
- Chickens play: 57% agree, 43% disagree.
- Chickens can feel positive emotions like pleasure: 52% agree, 48% disagree.
- Chickens have no personality: 48% agree, 52% disagree.
- Many of the farms that produce chickens have horrible living conditions: 48% agree, 52% disagree.
- Chickens carry diseases like salmonella: 45% agree, 55% disagree.
- Big chicken farms are gross: 41% agree, 59% disagree.
- Chickens are the most ethical animal to eat: 37% agree, 63% disagree.
- Eating chickens doesn’t contribute as much to climate change as eating other animals: 32% agree, 68% disagree.
- Chickens have a lower IQ than most animals: 28% agree, 72% disagree.

Percent of respondents who agreed (or disagreed) with each of the beliefs.
Which Categories of Beliefs Were Most Strongly Associated with Animal-Positive Behaviors?

Each individual belief is presented in the figures in the next section, grouped by category for each animal. The relative importance of each item within a group of beliefs can be seen for both diet pledges and petition signatures. We also discuss the top-performing individual beliefs across the categories. In general, average correlations for the beliefs in each category were small (< .20), with beliefs generally showing larger correlations with diet pledges than with petition signatures.

Table 1: Average Correlations With Pro-Animal Behavior (Overall Rankings)
Notes. Given the ordinal nature of the beliefs scale, Spearman rank-order correlations were used for all belief correlations.

Beliefs about Fishes
Belief categories are presented in order of the size of their average correlation with taking the diet pledge.

**Fish Emotions Beliefs**
Beliefs related to fish emotions showed the largest average correlation with taking the diet pledge ($r = .13, \text{SD} = .04$) and signing the petition ($r = .09, \text{SD} = .04$) out of all the categories of beliefs. In other words, people who believe that fishes experience emotions were more likely to take the diet pledge and sign the petition. Because emotion-related beliefs had the strongest correlations with both the fish pledge and petition, advocates focusing on these asks should consider including an emotion component to their messaging.

Looking at the strongest individual beliefs associated with each outcome, people who believe that fishes can feel negative emotions like fear or who believe that fishes can feel stress were more likely to take diet pledges. Those who believe that fishes can feel positive emotions like pleasure or that they can feel stress were more likely to sign the petition.
Beliefs related to fish suffering had the second largest average correlation with both the diet pledge ($r = .11, \ SD = .07$) and petition signatures ($r = .07, \ SD = .04$). The top beliefs most associated with taking the diet pledge were that many fish farms have horrible living conditions and that fishes feel pain. The belief that fishes feel pain was also stronger among petition signers, along with the belief that fishes need room to explore and exercise.

**Fish Suffering Beliefs**
The higher average correlation of the fish suffering category with both the diet pledge and the petition suggests that advocates could benefit from emphasizing the ability of fishes to suffer.

**Figure 5: Fish Suffering Beliefs And Animal-Positive Behaviors**

![Bar chart showing correlation between fish suffering beliefs and actions](chart-image)

**Fish Personality Beliefs**

Beliefs around fish personalities had the third highest average correlation with taking the diet pledge ($r = .11$, SD = .06) and the third lowest with signing the petition ($r = .05$, SD = .03). Individuals who believe that fishes had no personality were less likely to take the diet pledge,
while those who believe that fishes are curious and can bond with humans were more likely to take the pledge. There were no personality-related beliefs associated with an increased likelihood of signing the petition.

In other words, advocates interested in reducing fish consumption may have success by emphasizing aspects of fish personalities, such as their curiosity and ability to bond with humans, while other routes may be more fruitful for those seeking petition signatures.

Figure 6: Fish Personality Beliefs And Animal-Positive Behaviors
Fish Intelligence Beliefs

Fish intelligence beliefs had the fourth strongest average correlation with taking the diet pledge ($r = .09, SD = .07$) and second weakest with signing the petition ($r = .05, SD = .04$). Individuals who believe that fishes are more intelligent than people give them credit for were more likely to both take the diet pledge and sign the petition. Those who believe that fishes can learn were also more likely to take the diet pledge.

Figure 7: Fish Intelligence Beliefs And Animal-Positive Behaviors

Note: ** indicates that the correlation with petition signatures was significant. *** indicates that the correlation with diet pledges was significant.
**Fish Social Beliefs**

Beliefs related to the social lives of fishes had the third weakest average correlation with willingness to take a diet pledge \( (r = 0.07, \ SD = 0.06) \) and the third strongest with petition signatures \( (r = 0.06, \ SD = 0.02) \). Those who believe that fishes can communicate with each other were more likely to take the diet pledge.

**Figure 8: Fish Social Beliefs And Animal-Positive Behaviors**

Note: "*" indicates that the correlation with petition signatures was significant. "**" indicates that the correlation with diet pledges was significant.
Fish Consumption Beliefs

Beliefs related to the consumption of fish had the second weakest correlation with taking the diet pledge (r = .06, SD = .03) and the weakest correlation with signing the petition (r = .05, SD = .04). Those who believe that fish is a good source of protein were more likely to sign the welfare petition.

Individuals who believe that fish products labeled “sustainable” come from fishes with good welfare were less likely to take the diet pledge but more likely to sign the petition.

For advocates, this finding highlights the importance of considering the audience of a message and the ultimate goal of a campaign. While one message may be effective when seeking petition signatures, it may have the opposite effect on reducing consumption because it may suggest that it is acceptable to continue consuming fish.
**Other Fish Beliefs**

The weakest average correlation for taking the diet pledge \((r = .05, \text{SD} = .04)\) was with “other” fish beliefs, though they had the fourth highest average correlation with petition signatures \((r = .06, \text{SD} = .03)\). Those who believe fishes are gross were more likely to take the diet pledge but less likely to sign the petition.
Beliefs about Chickens

Belief categories are presented in order of the size of their average correlation with taking the diet pledge.

Note: "*" indicates that the correlation with petition signatures was significant. "**" indicates that the correlation with diet pledges was significant.
**Chicken Suffering Beliefs**

Beliefs related to chicken suffering had the highest average correlation with both taking the diet pledge \( (r = .15, \ SD = .07) \) and signing the petition \( (r = .12, \ SD = .04) \). In both cases, the strongest associations were found with the beliefs that chickens need room to explore and exercise, most chickens are raised inhumanely, and many chicken farms have horrible living conditions.

The higher correlations between suffering beliefs and both pledges and signatures compared to other categories suggest that this may be a particularly useful messaging approach for advocates to take. Because of this, and because the same beliefs were associated with animal-positive behaviors, advocates may find success stacking asks. In other words, they may be able to ask for diet pledges and petition signatures using the same messaging.
Figure 11: Chicken Suffering Beliefs And Animal-Positive Behaviors

Beliefs related to the emotions of chickens had the second highest average correlation for both taking the diet pledge ($r = .15, SD = .02$) and signing the petition ($r = .09, SD = .00$). For taking the diet pledge, the belief that chickens can feel positive emotions had the strongest association, and for signing the petition, the belief that chickens can feel stress had the strongest association. However, all three beliefs were correlated with both actions, suggesting that advocates may find success when emphasizing any type of emotions among chickens.
Figure 12: Chicken Emotion Beliefs And Animal-Positive Behaviors

Chicken Personality Beliefs

Personality beliefs related to chickens had the third highest average correlation with taking the diet pledge ($r = .11$, SD = .06) and third lowest with signing the petition ($r = .05$, SD = .03). Believing that chickens can bond with humans, play, and are loving had the strongest associations with taking the diet pledge. Those who believe that chickens don’t have personalities were less likely to take the diet pledge. The belief that chickens are loving was also associated with signing the welfare petition.
By emphasizing the bonding, playful, and loving parts of chickens’ personalities, advocates seeking a reduction in chicken consumption may be able to appeal to those who are already aware of these traits while simultaneously providing additional information to those who aren’t aware of them.

**Figure 13: Chicken Personality Beliefs And Animal-Positive Behaviors**

Note: ‘*’ indicates that the correlation with petition signatures was significant. ‘**’ indicates that the correlation with diet pledges was significant.
Other Chicken Beliefs

“Other” beliefs related to chickens had the fourth highest average correlation with taking the diet pledge ($r = .10, \ SD = .07$) and the third highest with signing the welfare petition ($r = .08, \ SD = .04$). The belief that chickens are beautiful had the strongest association with both the pledge and the petition, suggesting that advocates may find success with this message regardless of whether they are seeking petition signatures or diet pledges. People who believe that chickens carry diseases like salmonella were also more likely to take the diet pledge.

Figure 14: Other Chicken Beliefs And Animal-Positive Behaviors
**Chicken Intelligence Beliefs**

Chicken intelligence beliefs had the third weakest average correlation with taking the diet pledge \((r = .09, \text{SD} = .06)\) and the second weakest with signing the petition \((r = .04, \text{SD} = .02)\). Those who believe chickens are more intelligent than people give them credit for and that chickens can learn had stronger associations with taking the diet pledge. Advocates seeking to reduce chicken consumption may have more success when emphasizing the value of chickens’ intelligence rather than comparing their intelligence to the intelligence of other animals. No particularly strong associations stood out for signing the petition.

**Figure 15: Chicken Intelligence Beliefs And Animal-Positive Behaviors**

Note: “*” indicates that the correlation with petition signatures was significant. “**” indicates that the correlation with diet pledges was significant.
**Chicken Social Beliefs**

Beliefs about the social nature of chickens had the second lowest average correlation with taking the diet pledge ($r = .08$, $SD = .01$) and the fourth highest with signing the petition ($r = .08$, $SD = .00$). Individuals who believe that chickens can communicate with each other were more likely to take the diet pledge.

**Figure 16: Chicken Social Beliefs And Animal-Positive Behaviors**

Note: "*" indicates that the correlation with petition signatures was significant. "**" indicates that the correlation with diet pledges was significant.
**Chicken Consumption Beliefs**

For both taking the diet pledge ($r = .05$, SD = .04) and signing the welfare petition ($r = .02$, SD = .01), beliefs related to the consumption of chicken had the lowest average correlation. Those who believe that eating chicken doesn’t contribute as much to climate change as eating other animals were less likely to take the diet pledge. Because the relationship of consumption beliefs with animal-positive behaviors was weaker than for other categories of beliefs, advocates may find more success with those other categories. However, it may also be beneficial to explain the environmental benefits of reducing meat consumption.

**Figure 17: Chicken Consumption Beliefs And Animal-Positive Behaviors**

Note: "" indicates that the correlation with petition signatures was significant. """" indicates that the correlation with diet pledges was significant.
What Role Did Participant Traits Play?

Table 2 shows the rates of each pro-animal behavior for demographic groups that showed significant differences using a chi-square test of independence. Trends within ordinal variables were also identified using simple logistic regressions. These characteristics include age, income, education, and frequency of fish and chicken consumption. More detailed results can be found in the Supplementary Materials.

- Gender: Men were less likely than women or other genders to take the chicken diet pledge, but there were no other gender-based differences.
- Age: In general, older participants were less likely to take the fish diet pledge than younger participants.
- Income: Individuals with higher incomes tended to sign both the fish and chicken petitions more often than those with lower incomes.
- Education: Individuals with higher levels of education signed the chicken petition more often than those with lower levels of education.
- Region: The only regional differences came in the Southeast, where respondents were more likely to take the fish diet pledge than other regions, and the Central-West, where respondents were less likely to take the fish diet pledge than other regions.
- Guardians of companion animals: Guardians of companion animals were more likely to sign the fish welfare petition than non-guardians, but were otherwise just as likely to take a given animal-positive action as non-guardians.
- Recent fish consumption: Participants who ate higher amounts of fish were more likely to take the chicken diet pledge.
- No clear relationships exist between recent chicken consumption and pro-animal behaviors.

As a note, people who already abstained entirely from eating fish or chicken were not offered the diet pledge for that animal.

In addition to the characteristics shown discussed above, we looked for differences based on race (white, Pardo, Black, or other) and whether participants had fished or handled chickens recently. There were no significant differences between groups, which means that the overall percentages should be used for all groups to avoid over-interpretation of non-significant differences. As a reminder, those percentages were as follows: 61% of participants took the diet pledge to reduce their consumption of fish, and 52% agreed to reduce their consumption of chicken. 69% of participants agreed to sign the fish welfare petition and 70% agreed to sign the chicken welfare petition.
Table 2: Percent Who Took the Diet Pledge or Signed the Petition Based on Group Membership

<table>
<thead>
<tr>
<th></th>
<th>Fish Diet Pledge</th>
<th>Fish Petition Signature</th>
<th>Chicken Diet Pledge</th>
<th>Chicken Petition Signature</th>
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<tr>
<td><strong>Gender</strong></td>
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<tr>
<td>Woman or Other</td>
<td>61%</td>
<td>88%</td>
<td>60%</td>
<td>71%</td>
</tr>
<tr>
<td>Man</td>
<td>62%</td>
<td>73%</td>
<td>48%</td>
<td>71%</td>
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<tr>
<td><strong>Race</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>White</td>
<td>63%</td>
<td>72%</td>
<td>57%</td>
<td>71%</td>
</tr>
<tr>
<td>Pardo</td>
<td>59%</td>
<td>70%</td>
<td>47%</td>
<td>72%</td>
</tr>
<tr>
<td>Black</td>
<td>58%</td>
<td>68%</td>
<td>58%</td>
<td>72%</td>
</tr>
<tr>
<td>Other</td>
<td>62%</td>
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<td><strong>Went Fishing</strong></td>
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<tr>
<td>Yes</td>
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<td>53%</td>
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<tr>
<td>No</td>
<td>60%</td>
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<td>56%</td>
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<tr>
<td><strong>Handled Chickens</strong></td>
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<tr>
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<td>62%</td>
<td>59%</td>
<td>53%</td>
<td>71%</td>
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*Notes. An asterisk (*) indicates that there was a statistically significant difference between groups. For details on how these analyses were conducted, see the Supplementary Materials.

Conclusions

This study has added substantially to our body of knowledge regarding public beliefs about chickens and fishes in Brazil and how they relate to animal-positive actions.

Overall, 69% of participants agreed to sign the fish welfare petition, and 70% agreed to the chicken welfare petition. 61% of participants committed to reduce their consumption of fish, while 52% pledged to reduce their consumption of chicken.

Among those who pledged to reduce their fish consumption, 10% committed to reducing it entirely, 83% pledged to eat it less than once per week, and 4% pledged to eat it 1-3 times per week. These participants were willing to reduce their consumption to a greater degree than participants who pledged to reduce their chicken consumption. Of the participants who took the chicken pledge, 4% pledged to never eat chicken, 61% pledged to eat it less than once per week, and 33% pledged to eat it between 1-3 times per week. These reduction rates suggest that animal advocates may have more success asking for reductions in chicken and fish consumption rather than outright prohibition.
Which Beliefs Were Most Common?

The relative prevalence of various beliefs are summarized in Figures 1 and 2. These results can serve as useful guides for animal advocates when designing advocacy campaigns. For example, animal advocates may want to create campaign messaging that appeals to beliefs which are both widely held and associated with animal-positive actions in order to maximize behavior change. As an example, advocates could emphasize that fishes need space to explore and exercise or that chickens can feel pain. Similarly, showing individuals evidence that fish are loving may be an effective approach for encouraging reductions in fish consumption.

Beliefs that were less commonly held but which still had notable associations with pro-animal behaviors could be strong candidates for campaigns aimed at raising awareness. Advocates following this approach might consider displaying images of chickens playing or providing evidence of chickens’ and fishes’ capacity to learn. These messages could grow the proportion of people who hold beliefs associated with taking the dietary pledge. Similarly, advocates could show research demonstrating that fishes feel positive emotions like pleasure when seeking signatures on fish welfare petitions in Brazil.

In general, understanding the prevalence of various beliefs can help advocates target efforts based on where most people currently stand.

Beliefs Most Strongly Associated With Pro-Animal Behavior

Groups of Beliefs

Our calculations of the average correlation of the items in each group of beliefs, as well as the effect sizes displayed in Figures 3-16, can help advocates understand which groups of beliefs were most strongly associated with animal-positive behavior. For both chickens and fishes, beliefs about emotions and suffering were the two groups most strongly correlated with each animal-positive behavior. Personality beliefs were also among the groups with stronger associations with fish and chicken diet pledges. Conversely, the average correlations for consumption beliefs were consistently among the weakest for each animal-positive behavior.

Our results indicate that advocates who emphasize the emotions and suffering of chickens and fishes may be more successful in their efforts to get petition signatures or consumption reduction pledges than advocates who do not focus on these characteristics. Additionally, messaging that highlights chicken and fish personalities may also lead to a higher number of diet pledges. While some beliefs within these groups were among the most common, many were less common. For this reason, advocates are encouraged to look at the prevalence of individual beliefs to determine whether appealing to these beliefs or focusing on raising awareness is a more suitable approach.
Beliefs related to the consumption of fishes or chickens were uniformly among the least strongly associated with taking either dietary pledge. In other words, advocates should avoid focusing on these beliefs. A notable exception is the belief that fish products labeled “sustainable” come from fishes with good welfare, which was positively associated with signing the fish welfare petition. Future research should explore this association further to see what actionable insights advocates might be able to gain.

It is important to note that ranking belief groups according to average correlations has its limitations. The individual beliefs within a group of beliefs are not always associated with behavior in the same way or to the same extent. For any beliefs advocates are considering using, we suggest paying closer attention to the strength and direction of correlation for each individual belief than to the average correlation for the overall group.

**Individual Beliefs**

Within the emotions and suffering belief groups, beliefs that fishes and chickens can experience pain and stress, and require space to explore and exercise were all associated with both animal-positive actions. Because these beliefs were also prevalent among participants, advocates could consider highlighting them by, for example, showing how little space chickens and fishes are afforded in intensive growing operations. Beliefs about chickens' and fishes' positive and negative emotional experiences were less common, but were also correlated with animal-positive behaviors. Advocates may wish to focus on raising the public’s awareness of these capacities as a possible way to increase willingness to take diet pledges and sign welfare petitions.

A number of chicken suffering beliefs, particularly the beliefs that chickens don’t mind living in barren environments, that they are unbothered living in overcrowded environments, and that air and water quality are not important to them were associated with less willingness to take pro-animal actions. While these views were not among the most common, they are still prevalent enough to warrant attention. Research suggests that these views may be largely misinformed (Nordquist et al., 2017; Gomes et al, 2014; Campbell et al, 2019; Bersch, 2019). Efforts to shift these views may help reduce barriers to uptake of animal-positive action, although little is known about how effective informational campaigns will actually be at shifting these views among the populations that hold them.

Advocates should also note that while believing fishes experience positive emotions had a significant correlation with signing the welfare petition, this same belief did not have a notable association with taking the diet pledge. Instead, believing that fishes experience negative emotions was significantly associated with taking the diet pledge, but not with signing the welfare petition. In other words, advocates should distinguish their messages to emphasize positive or negative emotions of fish depending on whether they are seeking signatures or reductions in fish consumption. Alternatively, advocates could choose to emphasize other
beliefs, such as fishes’ ability to feel pain, that are significantly correlated with both signing the welfare petition and taking the diet pledge.

The beauty of chickens and the underappreciated intelligence of fishes also stood out among individual beliefs for their notable correlations with animal-positive behavior. The beliefs that chickens are beautiful and that fishes are more intelligent than people give them credit for were both associated with taking the diet pledge and signing the welfare petition.

Some research has shown that emotional reactions—like the feeling someone could get from seeing a particularly beautiful or intelligent animal—can have an effect on judgments and decision-making (Angie, et al., 2011). Contrasting the beauty and intelligence of an animal with the reality on industrial farms could be an effective strategy for encouraging pro-animal behavior. For instance, advocates could compare images of an especially colorful chicken or fishes solving complex problems with the harsh realities of chicken and fish farms. Because the belief that big chicken farms are gross was also associated with pro-animal behavior, using this strategy may be particularly effective for chickens.

**Participant Characteristics**

This study also allowed us to examine differences in willingness to sign welfare petitions and commit to diet pledges across participant characteristics, as summarized in Table 2. These insights can help advocates understand which social groups to target to increase the number of individuals taking animal-positive action.

We find that men were less likely than women or other genders to pledge to reduce their consumption of chicken. Moreover, older participants were less likely to take the fish pledge. However, these were the only clear differences in animal-positive behavior across gender and age.

There were no significant differences in willingness to take the diet pledges or sign the petitions across race. This highlights the need for advocates’ efforts to be inclusive of Brazil’s diverse population.

Compared to those with lower incomes, participants with higher incomes were more likely to sign both welfare petitions. Higher levels of education were also associated with willingness to sign the chicken petition compared to lower levels of education. Despite these differences, more than half of participants with lower incomes or levels of education still took diet pledges and signed petitions at rates in most cases. In other words, advocates should not focus their efforts exclusively on the wealthy or the highly educated. Advocates should also keep in mind that even though many people may be open to the idea of adopting animal-positive behaviors, barriers such as limited access to affordable plant-based options may make it more difficult for some people to transform their willingness into action.
In terms of geographic variation, participants living in the Southeast region were more likely to take the fish diet pledge, whereas individuals living in the Central-West region were less likely to take the fish diet pledge. Further research should explore these regional differences.

Finally, while individuals living with companion animals were more likely to sign the fish welfare petition, these individuals did not significantly differ from non-companion animal guardians in any other animal-positive behavior. Advocates seeking to improve fish living conditions may wish to compare fishes’ and companion animals’ abilities to suffer.

**Future Directions**

Although this research provides some useful guidelines for chicken and fish welfare advocacy, more research is required to understand whether these beliefs are a cause of animal-positive behaviors, or whether they are merely associated with them. In a continuation of this line of research, we will also be testing interventions that will attempt to use some of the beliefs that appear most important based on this research to understand whether shifting these beliefs can increase animal-positive behaviors. This will take the form of an experiment (randomized controlled trial), where different groups of people are shown an intervention that targets specific beliefs to see if any of them influence animal-positive behaviors.

**Supplementary Materials**

**Method: Additional Details**

*Participants and Power*

Participants were recruited using a panel company called CINT. In keeping with Faunalytics’ Data Quality Assurance Plan, we performed data checks to screen out answers that may be fraudulent or participants who fail attention checks.

Responses that showed poor data quality or the failure of attention-check questions were excluded. After removing participants in the data cleaning process, we had a total of 549 participants in the fish condition and 577 in the chicken condition. Power analyses indicated that a sample size of 497 per animal would allow for the detection of a small-to-medium effect size ($\rho = .16$) with a power of .95 in a point-biserial correlation (critical $t = 1.96$), so we were well-powered for our goals. For additional details on the measures, power analysis, analysis plan, and more, please see the pre-registration documents on the Open Science Framework.
Table 3: Participants Traits

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<th>Category</th>
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<tbody>
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<td><strong>Gender</strong></td>
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<td>Man</td>
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<td>White</td>
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<td>Pardo</td>
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<tr>
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<td><strong>Income</strong></td>
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<tr>
<td>Annual salary less than R$14,300.00</td>
<td>312</td>
<td>28%</td>
</tr>
<tr>
<td>Annual salary between R$14,300.00 and R$71,500.00</td>
<td>515</td>
<td>46%</td>
</tr>
<tr>
<td>Annual salary between R$71,500.00 and R$143,000.00</td>
<td>223</td>
<td>20%</td>
</tr>
<tr>
<td>Annual salary greater than R$143,000.00</td>
<td>73</td>
<td>6%</td>
</tr>
<tr>
<td>Missing</td>
<td>3</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incomplete high school</td>
<td>48</td>
<td>4%</td>
</tr>
<tr>
<td>Completed high school</td>
<td>326</td>
<td>29%</td>
</tr>
<tr>
<td>Incomplete higher education</td>
<td>163</td>
<td>14%</td>
</tr>
<tr>
<td>Completed higher education</td>
<td>489</td>
<td>43%</td>
</tr>
<tr>
<td>Master’s degree</td>
<td>78</td>
<td>7%</td>
</tr>
<tr>
<td>Doctorate degree</td>
<td>22</td>
<td>2%</td>
</tr>
<tr>
<td><strong>Region</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>North (Norte)</td>
<td>77</td>
<td>7%</td>
</tr>
<tr>
<td>Northeast (Nordeste)</td>
<td>290</td>
<td>26%</td>
</tr>
<tr>
<td>Southeast (Sudeste)</td>
<td>582</td>
<td>52%</td>
</tr>
<tr>
<td>South (Sul)</td>
<td>100</td>
<td>9%</td>
</tr>
<tr>
<td>Central-West (Centro-Oeste)</td>
<td>77</td>
<td>7%</td>
</tr>
<tr>
<td><strong>Companion Animals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>962</td>
<td>85%</td>
</tr>
<tr>
<td>No</td>
<td>164</td>
<td>15%</td>
</tr>
<tr>
<td><strong>Want Fishing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>598</td>
<td>53%</td>
</tr>
<tr>
<td>No</td>
<td>528</td>
<td>47%</td>
</tr>
<tr>
<td><strong>Handled Chickens</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>250</td>
<td>22%</td>
</tr>
<tr>
<td>No</td>
<td>876</td>
<td>78%</td>
</tr>
<tr>
<td><strong>Fish Consumption</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>134</td>
<td>12%</td>
</tr>
<tr>
<td>Less than once per week</td>
<td>520</td>
<td>46%</td>
</tr>
<tr>
<td>1-2 times per week</td>
<td>349</td>
<td>31%</td>
</tr>
<tr>
<td>4-6 times per week</td>
<td>78</td>
<td>7%</td>
</tr>
<tr>
<td>1 or more times per day</td>
<td>45</td>
<td>4%</td>
</tr>
<tr>
<td><strong>Chicken Consumption</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>28</td>
<td>2%</td>
</tr>
<tr>
<td>Less than once per week</td>
<td>136</td>
<td>12%</td>
</tr>
<tr>
<td>1-3 times per week</td>
<td>581</td>
<td>52%</td>
</tr>
<tr>
<td>4-6 times per week</td>
<td>283</td>
<td>25%</td>
</tr>
<tr>
<td>1 or more times per day</td>
<td>98</td>
<td>9%</td>
</tr>
</tbody>
</table>
Correlational Analyses

Spearman rank-order correlations were used for analyses because the outcome variables were dichotomous and beliefs were rated on a Likert scale. They can be interpreted the same way as standard Pearson correlations. The scores range from -1 to 1, with scores further away from zero indicating a stronger relationship between the variables in question. It is also an indication of effect size.

Petition Measure

For consistency with the first report in this line of research, the petition outcome variable is measured using agreement to sign the welfare petition rather than whether participants clicked the link to the petition.

Participant Traits Analyses

For our analysis of participant traits, all of which were categorical, we used chi-square tests of independence to test for differences across levels of each trait category. For ordinal variables, we used simple logistic regressions to determine trends.

When conducting chi-square tests on tables with cells containing expected values below 5, Monte Carlo simulations were necessarily used to compute p-values.

Table 4: Summarized Chi-Square Results

<table>
<thead>
<tr>
<th>IV</th>
<th>Fish Diet Pledge</th>
<th>Fish Petition Signature</th>
<th>Chicken Diet Pledge</th>
<th>Chicken Petition Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>χ² 0.03 p-value 0.87</td>
<td>χ² 1.42 p-value 0.23</td>
<td>χ² 5.02 p-value 0.00</td>
<td>χ² 0.00 p-value 0.95</td>
</tr>
<tr>
<td>Race</td>
<td>χ² 1.07 p-value 0.78</td>
<td>χ² 0.56 p-value 0.91</td>
<td>χ² 5.69 p-value 0.13</td>
<td>χ² 0.65 p-value 0.89</td>
</tr>
<tr>
<td>Age Group</td>
<td>χ² 9.33 p-value 0.06</td>
<td>χ² 5.84 p-value 0.03</td>
<td>χ² 5.24 p-value 0.01</td>
<td>χ² 9.95 p-value 0.00</td>
</tr>
<tr>
<td>Income</td>
<td>χ² 6.13 p-value 0.11</td>
<td>χ² 6.41 p-value 0.09</td>
<td>χ² 3.51 p-value 0.32</td>
<td>χ² 12.70 p-value 0.01</td>
</tr>
<tr>
<td>Education</td>
<td>χ² 2.16 p-value 0.84</td>
<td>χ² 3.09 p-value 0.70</td>
<td>χ² 3.70 p-value 0.12</td>
<td>χ² 11.97 p-value 0.03</td>
</tr>
<tr>
<td>Region</td>
<td>χ² 13.30 p-value 0.01</td>
<td>χ² 0.86 p-value 0.93</td>
<td>χ² 7.48 p-value 0.11</td>
<td>χ² 1.90 p-value 0.75</td>
</tr>
<tr>
<td>Companion Animals</td>
<td>χ² 1.83 p-value 0.18</td>
<td>χ² 4.02 p-value 0.05</td>
<td>χ² 1.00 p-value 0.32</td>
<td>χ² 0.35 p-value 0.54</td>
</tr>
<tr>
<td>Went Fishing</td>
<td>χ² 0.15 p-value 0.70</td>
<td>χ² 3.18 p-value 0.07</td>
<td>χ² 0.33 p-value 0.56</td>
<td>χ² 0.09 p-value 0.97</td>
</tr>
<tr>
<td>Handled Chickens</td>
<td>χ² 0.02 p-value 0.88</td>
<td>χ² 3.31 p-value 0.07</td>
<td>χ² 0.65 p-value 0.41</td>
<td>χ² 0.11 p-value 0.73</td>
</tr>
<tr>
<td>Fish Consumption</td>
<td>χ² 4.79 p-value 0.31</td>
<td>χ² 2.30 p-value 0.68</td>
<td>χ² 7.53 p-value 0.11</td>
<td>χ² 1.13 p-value 0.89</td>
</tr>
<tr>
<td>Chicken Consumption</td>
<td>χ² 2.83 p-value 0.62</td>
<td>χ² 0.73 p-value 0.95</td>
<td>χ² 10.53 p-value 0.02</td>
<td>χ² 3.09 p-value 0.54</td>
</tr>
</tbody>
</table>

Table 5: Summarized Logistic Regression Results

<table>
<thead>
<tr>
<th>IV</th>
<th>Fish Diet Pledge β p-value</th>
<th>Fish Petition Signature β p-value</th>
<th>Chicken Diet Pledge β p-value</th>
<th>Chicken Petition Signature β p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-0.02 p-value 0.01</td>
<td>0.01 p-value 0.25</td>
<td>-0.01 p-value 0.07</td>
<td>0.01 p-value 0.09</td>
</tr>
<tr>
<td>Income</td>
<td>0.15 p-value 0.16</td>
<td>0.26 p-value 0.02</td>
<td>0.02 p-value 0.31</td>
<td>0.39 p-value 0.00</td>
</tr>
<tr>
<td>Education</td>
<td>-0.01 p-value 0.92</td>
<td>0.04 p-value 0.63</td>
<td>0.09 p-value 0.12</td>
<td>0.17 p-value 0.04</td>
</tr>
<tr>
<td>Fish Consumption</td>
<td>-0.11 p-value 0.28</td>
<td>0.05 p-value 0.60</td>
<td>0.23 p-value 0.02</td>
<td>0.07 p-value 0.50</td>
</tr>
<tr>
<td>Chicken Consumption</td>
<td>0.00 p-value 0.97</td>
<td>0.00 p-value 0.99</td>
<td>-0.04 p-value 0.72</td>
<td>-0.01 p-value 0.94</td>
</tr>
</tbody>
</table>
Average Correlation by Group of Beliefs

The average correlation for each group of beliefs are shown in Table 6 for fishes and Table 7 for chickens. These were also provided in text in the body of the report.

To get these numbers, we averaged the absolute value of each of the correlations for the items in a group for each of the outcome variables. Because the number of responses used for each correlation was approximately the same, this “average of averages” approach does not weight any correlation unduly.

Table 6: Average Correlation of Fish Beliefs by Category

<table>
<thead>
<tr>
<th>Belief Category</th>
<th>Correlation Average</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish emotions beliefs and diet pledge</td>
<td>0.13</td>
<td>0.04</td>
</tr>
<tr>
<td>Fish emotions beliefs and petition</td>
<td>0.09</td>
<td>0.04</td>
</tr>
<tr>
<td>Fish suffering beliefs and diet pledge</td>
<td>0.11</td>
<td>0.07</td>
</tr>
<tr>
<td>Fish suffering beliefs and petition</td>
<td>0.07</td>
<td>0.04</td>
</tr>
<tr>
<td>Fish personality beliefs and diet pledge</td>
<td>0.11</td>
<td>0.06</td>
</tr>
<tr>
<td>Fish personality beliefs and petition</td>
<td>0.05</td>
<td>0.03</td>
</tr>
<tr>
<td>Fish intelligence beliefs and diet pledge</td>
<td>0.09</td>
<td>0.07</td>
</tr>
<tr>
<td>Fish intelligence beliefs and petition</td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td>Fish social beliefs and diet pledge</td>
<td>0.07</td>
<td>0.06</td>
</tr>
<tr>
<td>Fish social beliefs and petition</td>
<td>0.06</td>
<td>0.02</td>
</tr>
<tr>
<td>Fish consumption beliefs and diet pledge</td>
<td>0.06</td>
<td>0.03</td>
</tr>
<tr>
<td>Fish consumption beliefs and petition</td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td>Other fish beliefs and diet pledge</td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td>Other fish beliefs and petition</td>
<td>0.06</td>
<td>0.03</td>
</tr>
</tbody>
</table>
As noted in the Results section, beliefs around the emotions, suffering, and personalities of fishes were the categories most strongly associated with diet pledges. Beliefs around fish emotions and suffering were also most strongly associated with petition signatures.

For chickens, the suffering and emotion groups of beliefs were most strongly associated with pledges, and the beliefs around suffering were most strongly associated with petition signatures.

**Individual Beliefs**

Table 8 and Table 9 below contain the correlation results for all individual beliefs. By default, the beliefs with the strongest average association with the two outcome variables are at the top of the table. The “Mean” column contains a zero-centered average of the 7-point Likert scale used for each belief.
### Table 8: Individual Fish Beliefs

<table>
<thead>
<tr>
<th>Belief</th>
<th>Conceptual Category</th>
<th>Mean</th>
<th>SD</th>
<th>Pledge Correlation</th>
<th>Petition Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish can feel pain</td>
<td>Suffering</td>
<td>1.55</td>
<td>1.41</td>
<td>0.18*</td>
<td>0.12*</td>
</tr>
<tr>
<td>Fish need room to explore and exercise</td>
<td>Suffering</td>
<td>1.57</td>
<td>1.35</td>
<td>0.16*</td>
<td>0.12*</td>
</tr>
<tr>
<td>Many of the farms that produce fish have horrible living conditions</td>
<td>Suffering</td>
<td>-0.14</td>
<td>1.65</td>
<td>0.19*</td>
<td>0.06</td>
</tr>
<tr>
<td>Most farmed fish are raised inhumanely</td>
<td>Suffering</td>
<td>0.03</td>
<td>1.69</td>
<td>0.16*</td>
<td>0.09*</td>
</tr>
<tr>
<td>Fish are more intelligent than people give them credit for</td>
<td>Intelligence</td>
<td>1.01</td>
<td>1.48</td>
<td>0.15*</td>
<td>0.10*</td>
</tr>
<tr>
<td>Fish can feel stress</td>
<td>Emotions</td>
<td>1.52</td>
<td>1.37</td>
<td>0.14*</td>
<td>0.10*</td>
</tr>
<tr>
<td>Fish have no personality</td>
<td>Personality</td>
<td>-0.63</td>
<td>1.60</td>
<td>-0.17*</td>
<td>-0.06</td>
</tr>
<tr>
<td>Fish are curious</td>
<td>Personality</td>
<td>1.42</td>
<td>1.28</td>
<td>0.16*</td>
<td>0.07</td>
</tr>
<tr>
<td>Fish can learn</td>
<td>Intelligence</td>
<td>0.76</td>
<td>1.56</td>
<td>0.14*</td>
<td>0.07</td>
</tr>
<tr>
<td>Fish can feel negative emotions like fear</td>
<td>Emotions</td>
<td>1.05</td>
<td>1.51</td>
<td>0.17*</td>
<td>0.05</td>
</tr>
<tr>
<td>Fish can feel positive emotions like pleasure</td>
<td>Emotions</td>
<td>0.58</td>
<td>1.56</td>
<td>0.08</td>
<td>0.12*</td>
</tr>
<tr>
<td>Fish can bond with humans</td>
<td>Personality</td>
<td>0.59</td>
<td>1.66</td>
<td>0.14*</td>
<td>0.04</td>
</tr>
<tr>
<td>Fish can communicate with each other</td>
<td>Social</td>
<td>1.70</td>
<td>1.20</td>
<td>0.11*</td>
<td>0.07</td>
</tr>
<tr>
<td>Fish play</td>
<td>Personality</td>
<td>1.31</td>
<td>1.35</td>
<td>0.10*</td>
<td>0.08</td>
</tr>
<tr>
<td>Fish are loving</td>
<td>Personality</td>
<td>1.90</td>
<td>1.13</td>
<td>0.10*</td>
<td>0.07</td>
</tr>
<tr>
<td>Fish don’t mind being in a barren environment</td>
<td>Suffering</td>
<td>-0.87</td>
<td>1.69</td>
<td>-0.07</td>
<td>-0.08</td>
</tr>
<tr>
<td>Fish are beautiful</td>
<td>Other</td>
<td>2.08</td>
<td>1.02</td>
<td>0.08</td>
<td>0.06</td>
</tr>
<tr>
<td>Fish don’t care about being over-crowded</td>
<td>Suffering</td>
<td>-1.16</td>
<td>1.66</td>
<td>-0.05</td>
<td>-0.07</td>
</tr>
<tr>
<td>Individual fish don’t have unique characteristics</td>
<td>Personality</td>
<td>-1.69</td>
<td>1.36</td>
<td>-0.07</td>
<td>-0.02</td>
</tr>
<tr>
<td>Fish is a good source of protein</td>
<td>Consumption</td>
<td>2.23</td>
<td>1.09</td>
<td>-0.01</td>
<td>0.09*</td>
</tr>
<tr>
<td>Big fish farms are gross</td>
<td>Suffering</td>
<td>-0.92</td>
<td>1.54</td>
<td>0.07</td>
<td>0.01</td>
</tr>
<tr>
<td>Fish have a lower IQ than most animals</td>
<td>Intelligence</td>
<td>-0.20</td>
<td>1.43</td>
<td>-0.05</td>
<td>-0.02</td>
</tr>
<tr>
<td>Fish don’t care for their young</td>
<td>Social</td>
<td>-1.35</td>
<td>1.47</td>
<td>-0.03</td>
<td>-0.05</td>
</tr>
<tr>
<td>Fish never find it stressful to be picked up or handled</td>
<td>Suffering</td>
<td>-1.53</td>
<td>1.65</td>
<td>-0.05</td>
<td>-0.02</td>
</tr>
<tr>
<td>Fish are the most ethical animal to eat</td>
<td>Consumption</td>
<td>0.24</td>
<td>1.75</td>
<td>-0.07</td>
<td>0.00</td>
</tr>
<tr>
<td>Fish are contaminated with plastics, heavy metals, and chemicals</td>
<td>Other</td>
<td>1.07</td>
<td>1.57</td>
<td>-0.01</td>
<td>0.07</td>
</tr>
<tr>
<td>Eating fish doesn’t contribute as much to climate change as eating other animals</td>
<td>Consumption</td>
<td>-0.35</td>
<td>1.59</td>
<td>-0.03</td>
<td>0.00</td>
</tr>
<tr>
<td>Fish are easy to raise</td>
<td>Other</td>
<td>-0.09</td>
<td>1.61</td>
<td>-0.02</td>
<td>-0.02</td>
</tr>
<tr>
<td>Fish are the healthiest animal to eat</td>
<td>Consumption</td>
<td>1.67</td>
<td>1.31</td>
<td>-0.09</td>
<td>0.06</td>
</tr>
<tr>
<td>Most fish people eat are caught wild in the ocean</td>
<td>Consumption</td>
<td>0.10</td>
<td>1.68</td>
<td>0.05</td>
<td>-0.03</td>
</tr>
<tr>
<td>Fish mostly act out of instinct</td>
<td>Intelligence</td>
<td>1.32</td>
<td>1.28</td>
<td>-0.02</td>
<td>0.00</td>
</tr>
<tr>
<td>If fish products are labelled “sustainable,” they come from fish with good welfare</td>
<td>Consumption</td>
<td>0.57</td>
<td>1.46</td>
<td>-0.09*</td>
<td>0.08*</td>
</tr>
<tr>
<td>Fish are gross</td>
<td>Other</td>
<td>-2.18</td>
<td>1.08</td>
<td>0.09*</td>
<td>-0.09*</td>
</tr>
<tr>
<td>Fish are aggressive</td>
<td>Personality</td>
<td>-0.88</td>
<td>1.52</td>
<td>0.01</td>
<td>-0.09*</td>
</tr>
<tr>
<td>Water quality isn’t that important to fish</td>
<td>Suffering</td>
<td>-2.11</td>
<td>1.48</td>
<td>0.02</td>
<td>-0.02</td>
</tr>
</tbody>
</table>

*Notes. An asterisk (*) indicates a statistically significant correlation.*
Table 9: Individual Chicken Beliefs

<table>
<thead>
<tr>
<th>Belief</th>
<th>Conceptual Category</th>
<th>Mean</th>
<th>SD</th>
<th>Pledge Correlation</th>
<th>Petition Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chickens need room to explore and exercise</td>
<td>Suffering</td>
<td>1.52</td>
<td>1.39</td>
<td>0.25*</td>
<td>0.18*</td>
</tr>
<tr>
<td>Most chickens are raised inhumanely</td>
<td>Suffering</td>
<td>0.70</td>
<td>1.69</td>
<td>0.24*</td>
<td>0.18*</td>
</tr>
<tr>
<td>Many of the farms that produce chickens have horrible living conditions</td>
<td>Suffering</td>
<td>0.26</td>
<td>1.75</td>
<td>0.21*</td>
<td>0.14*</td>
</tr>
<tr>
<td>Chickens are beautiful</td>
<td>Other</td>
<td>1.28</td>
<td>1.37</td>
<td>0.18*</td>
<td>0.14*</td>
</tr>
<tr>
<td>Chickens can bond with humans</td>
<td>Personality</td>
<td>0.84</td>
<td>1.57</td>
<td>0.22*</td>
<td>0.08</td>
</tr>
<tr>
<td>Chickens can feel pan</td>
<td>Suffering</td>
<td>2.05</td>
<td>1.20</td>
<td>0.15*</td>
<td>0.12*</td>
</tr>
<tr>
<td>Chickens can feel positive emotions like pleasure</td>
<td>Emotions</td>
<td>0.65</td>
<td>1.48</td>
<td>0.17*</td>
<td>0.09*</td>
</tr>
<tr>
<td>Chickens can feel negative emotions like fear</td>
<td>Emotions</td>
<td>1.50</td>
<td>1.31</td>
<td>0.15*</td>
<td>0.09*</td>
</tr>
<tr>
<td>Chickens are loving</td>
<td>Personality</td>
<td>1.07</td>
<td>1.32</td>
<td>0.14*</td>
<td>0.10*</td>
</tr>
<tr>
<td>Big chicken farms are gross</td>
<td>Suffering</td>
<td>-0.16</td>
<td>1.72</td>
<td>0.11*</td>
<td>0.11*</td>
</tr>
<tr>
<td>Chickens can feel stress</td>
<td>Emotions</td>
<td>1.78</td>
<td>1.27</td>
<td>0.13*</td>
<td>0.09*</td>
</tr>
<tr>
<td>Chickens play</td>
<td>Personality</td>
<td>0.70</td>
<td>1.48</td>
<td>0.17*</td>
<td>0.04</td>
</tr>
<tr>
<td>Chickens don’t care about being overcrowded</td>
<td>Suffering</td>
<td>-0.88</td>
<td>1.77</td>
<td>-0.13*</td>
<td>-0.08*</td>
</tr>
<tr>
<td>Chickens are more intelligent than people give them credit for</td>
<td>Intelligence</td>
<td>0.74</td>
<td>1.49</td>
<td>0.15*</td>
<td>0.05</td>
</tr>
<tr>
<td>Chickens don’t mind being in a barren environment</td>
<td>Suffering</td>
<td>-0.98</td>
<td>1.67</td>
<td>-0.11*</td>
<td>-0.09*</td>
</tr>
<tr>
<td>Air and water quality aren’t that important to chickens</td>
<td>Suffering</td>
<td>-1.42</td>
<td>1.68</td>
<td>-0.10*</td>
<td>-0.09*</td>
</tr>
<tr>
<td>Chickens carry diseases like salmonella</td>
<td>Other</td>
<td>0.27</td>
<td>1.65</td>
<td>0.13*</td>
<td>0.06</td>
</tr>
<tr>
<td>Chickens can communicate with each other</td>
<td>Social</td>
<td>1.41</td>
<td>1.26</td>
<td>0.09*</td>
<td>0.08</td>
</tr>
<tr>
<td>Chickens don’t care for their young</td>
<td>Social</td>
<td>-1.89</td>
<td>1.38</td>
<td>-0.08</td>
<td>-0.08</td>
</tr>
<tr>
<td>Chickens are gross</td>
<td>Other</td>
<td>-1.65</td>
<td>1.40</td>
<td>-0.08</td>
<td>-0.07</td>
</tr>
<tr>
<td>Chickens can learn</td>
<td>Intelligence</td>
<td>0.78</td>
<td>1.52</td>
<td>0.12*</td>
<td>0.03</td>
</tr>
<tr>
<td>Chickens have no personality</td>
<td>Personality</td>
<td>-0.49</td>
<td>1.59</td>
<td>-0.12*</td>
<td>-0.01</td>
</tr>
<tr>
<td>Chickens never find it stressful to be picked up or handled</td>
<td>Suffering</td>
<td>-1.48</td>
<td>1.54</td>
<td>-0.06</td>
<td>-0.06</td>
</tr>
<tr>
<td>Individual chickens don’t have unique characteristics</td>
<td>Personality</td>
<td>-1.19</td>
<td>1.56</td>
<td>-0.05</td>
<td>-0.06</td>
</tr>
<tr>
<td>Eating chickens doesn’t contribute as much to climate change as eating other animals</td>
<td>Consumption</td>
<td>-0.13</td>
<td>1.52</td>
<td>-0.11*</td>
<td>0.00</td>
</tr>
<tr>
<td>Chickens mostly act out of instinct</td>
<td>Intelligence</td>
<td>1.21</td>
<td>1.31</td>
<td>0.06</td>
<td>0.05</td>
</tr>
<tr>
<td>Chickens are curious</td>
<td>Personality</td>
<td>1.60</td>
<td>1.15</td>
<td>0.06</td>
<td>0.04</td>
</tr>
<tr>
<td>Chickens are aggressive</td>
<td>Personality</td>
<td>-0.98</td>
<td>1.53</td>
<td>-0.05</td>
<td>-0.04</td>
</tr>
<tr>
<td>Chicken is a good source of protein</td>
<td>Consumption</td>
<td>1.87</td>
<td>1.16</td>
<td>-0.08</td>
<td>0.02</td>
</tr>
<tr>
<td>If chicken products are labelled “organic,” they come from chickens with good welfare</td>
<td>Consumption</td>
<td>0.97</td>
<td>1.46</td>
<td>0.02</td>
<td>0.02</td>
</tr>
<tr>
<td>Chickens are easy to raise</td>
<td>Other</td>
<td>0.80</td>
<td>1.58</td>
<td>-0.01</td>
<td>0.05</td>
</tr>
<tr>
<td>Chickens have a lower IQ than most animals</td>
<td>Intelligence</td>
<td>-0.08</td>
<td>1.34</td>
<td>-0.02</td>
<td>-0.01</td>
</tr>
<tr>
<td>Chickens are the most ethical animal to eat</td>
<td>Consumption</td>
<td>-0.06</td>
<td>1.80</td>
<td>-0.02</td>
<td>-0.01</td>
</tr>
<tr>
<td>Chicken is the healthiest animal to eat</td>
<td>Consumption</td>
<td>0.87</td>
<td>1.47</td>
<td>-0.02</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Notes. An asterisk (*) indicates a statistically significant correlation.
Beliefs About Fishes and Chickens & Their Relation to Animal-Positive Behaviors in Canada

January 2022

Authors: Zach Wulderk, Sebastian Quaade, Dr. Jo Anderson, Dr. Courtney Dillard, Dr. Walter Sánchez-Suárez, and Tom Beggs, MA
Background

Animals raised for food generally receive significantly less attention and funding than companion animals (Faunalytics, 2019). In Canada, as in most countries, small-bodied animals like chickens and fish are killed in particularly massive numbers: Over 770 million chickens were slaughtered in 2019 and nearly 840 thousand tonnes of fishes were slaughtered in 2018 in Canada alone (Faunalytics, 2020). Unfortunately, the welfare of these animals is not well-protected by Canadian law. The federal government does not regulate farming practices to guarantee animal welfare, instead opting for a system of de facto industry self-regulation (World Animal Protection, 2020). Due to the resulting standards, Canada receives a “D” grade for its protection of animals used in farming from World Animal Protection.

Despite fishes and chickens constituting a huge proportion of farmed animals, little is known about public attitudes toward these animals in Canada. This study replicates our study of fish and chicken beliefs in the U.S. to illuminate which beliefs the Canadian public has about small-bodied animals, and how these beliefs are related to animal-positive behaviors. Specifically, we examined the relationships between various beliefs and a willingness to reduce consumption of chickens or fishes and to sign a petition calling for improved living and slaughter conditions. Answering these questions is a first step toward understanding beliefs and attitudes that drive pro-animal behavior in Canada. The findings presented in this report may also prove useful to animal advocates who are seeking to target a Canadian audience more effectively.

Key Findings

1. **People were more likely to sign the petition than to take the dietary pledge.** People were more likely to sign a petition that calls for welfare reforms than to take a diet pledge to reduce their own consumption of fish or chicken. Fewer than half of people were willing to take any of these pro-animal actions.

2. **The beliefs that had the largest correlations with signing a pledge to reduce fish consumption were that fish can feel positive emotions like pleasure, that fish are loving, that big fish farms are gross, and that fish are more intelligent than they are given credit for.** Focusing advocacy efforts on bolstering these fish-related beliefs may be the most effective way to obtain dietary pledges to reduce consumption.

3. **The beliefs that had the largest correlations with fish welfare petition signatures were that fish can feel positive emotions like pleasure and that fish can learn.** Advocates working on petitions for fish welfare may want to incorporate these themes in their messaging and presentation.

4. **The beliefs that had the largest correlations with signing a pledge to reduce chicken consumption were that chickens are loving, that chickens play, that**
chickens are beautiful, and that most chickens are raised inhumanely. Those trying to get people to reduce their consumption of chicken may wish to focus on these themes.

5. The beliefs that had the largest correlations with chicken welfare petition signatures were that chickens are more intelligent than people give them credit for and that chickens can bond with humans. Advocates working on corporate campaigns may find messaging around these beliefs leads to an increase in petition signatures for chicken causes.

Recommendations

1. Try messaging around the top beliefs to see if you can improve your advocacy efforts. Based on these findings, messaging around emotions, personality, intelligence, and socialness will likely lead to the best results, even outside the context of diet pledges and welfare petitions. Slightly different beliefs were also important for each animal and each outcome. Therefore, we’d suggest focusing on the strongest messages in each group of beliefs, trying them out, and keeping track of their effectiveness in order to get the best results!

2. Try stacking your asks. People were more likely to agree to sign a petition than to take a diet pledge to reduce their consumption. If you have interest in both outcomes, try asking for the petition signature first, and then go for a diet pledge after they’ve signed the petition. This may help increase diet pledges due to something known as “behavior consistency”—people generally want to be consistent in what they do, so following one successful ask with another related ask may increase uptake. Be careful to avoid overloading people with requests, though.

3. Explore the results from other countries and check back for more recommendations as our program of research focusing on chickens and fishes continues. We have also examined these beliefs in other countries, including the U.S., Brazil, China, and India. We will also be using experimental research to provide stronger recommendations about how these beliefs can be leveraged to alter behaviors. Although we have provided preliminary recommendations in this report, an experimental comparison of the most common and strongly associated beliefs is needed to see which can be used most effectively. This research will focus on the U.S., but may have implications for future research in Canada. Stay tuned for more from our line of research into small-bodied animals!
Research Team

This project is a collaboration between researchers at Faunalytics and Mercy For Animals (MFA): namely, Zach Wulderk, Jo Anderson, and Tom Beggs of Faunalytics and Courtney Dillard, Walter Sanchez-Suarez, and Sebastian Quaade of MFA. We are indebted to Meredith Hui, Rashmit Arora, Diogo Fernandes, and Vitor Clemente for their assistance with linguistic and cultural translation, and to Cristina Mendonça, Meredith Hui, and Nikunj Sharma for their invaluable feedback.

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Method Overview

This research is a replication of Faunalytics’ 2020 report Beliefs About Fish and Chickens & Their Relation to Animal-Positive Behaviors, which focused on U.S. adults’ beliefs about small-bodied animals. For this project, we explored beliefs held by adults in Canada. We examined 7 categories of beliefs: about emotions, suffering, personality, intelligence, socialness, consuming the animal, and an “other” category. There were several beliefs in each category, meaning the full list consisted of 33 beliefs about fishes and 32 beliefs about chickens.

We surveyed 1,339 Canadian adults and randomly assigned them to either the fish or chicken version of the survey. We then asked them to rate their level of agreement or disagreement with each of the beliefs for their assigned animal. The survey instrument can be found on Open Science Framework.

We examined two key outcome measures in order to understand how much each belief was associated with important behaviors related to the welfare of each animal: willingness to take a “diet pledge” and willingness to sign a “welfare petition.” For the diet pledge outcome, each participant was asked if they would pledge to reduce their consumption of their assigned animal. For example, participants assigned the fish condition were shown a prompt that read, “In recent years, many people have begun to reduce how much fish they eat, a pattern that is expected to continue. Will you pledge to reduce your own fish consumption?” Those who agreed were then asked to specify the amount they would limit themselves to and to provide a digital signature for their commitment.

For the petition outcome, each participant was asked if they would sign a petition to improve the welfare of their assigned animal. For example, participants in the chicken condition were shown a prompt that read, “We would like to give you the opportunity to sign a petition that would encourage legal reforms to improve the lives of farmed chickens. Specifically, the petition is designed to build support for regulations that would ensure that chickens raised on farms would have improved living and slaughter conditions. Would you be willing to sign this petition?” Participants were able to respond with “yes please” or “no thanks.”
The diet pledge and petition questions were presented at the end of the survey, where they saw a prompt reading, “Great, thank you! Before you finish, we have a couple of quick requests for you. You don’t have to agree to either, but please answer each question.” We specified that respondents’ participation incentive did not rely on them committing to the diet pledge or signing the welfare petition. The two outcome measures were counterbalanced, meaning that half of the participants saw the diet pledge first and half saw the welfare petition first.

Throughout this report, we use the plural “fishes” rather than “fish” in order to acknowledge that we are discussing a collection of individuals. Exceptions are made for verbatim references to the survey instruments, which used the plural “fish” because it is more common among the general public.

All top-line descriptive statistics were calculated using data weighted to match population values for gender, age, race, and region. However, as the differences between the weighted and unweighted data were not large, inferential statistics were calculated using unweighted data to avoid introducing additional sources of variance. Additional information on participant traits can be found in the Supplementary Materials.

Results

How Many People Took the Pledge and Signed the Petition?

Figure 1: Rates of Animal-Positive Behavior

39% of Canadian participants pledged to reduce their consumption of fish and 37% agreed to reduce their consumption of chicken. 44% of participants agreed to sign the fish welfare petition and 47% agreed to sign the chicken welfare petition.

Among the participants who pledged to reduce their consumption of fish, 9% pledged to never eat fish, 77% pledged to eat it less than once per week, and 12% pledged to eat it only 1-3 times per week. Of chicken pledge-takers, 5% pledged to never eat chicken, 66% pledged to eat it less than once per week, and 24% pledged to eat it only 1-3 times per week.
The Most Common Canadian Beliefs about Fishes & Chickens

The following figures show all of the beliefs included in the study and the proportion of people who either agreed or disagreed with each, depending on which value was greater. This can give a sense of how common each of the beliefs are, which can be helpful in deciding which beliefs already exist and can be tapped into, and which beliefs need to be encouraged.

Fishes

Figure 2: Beliefs About Fishes


**Chickens**

**Figure 3: Beliefs About Chickens**

Each individual belief is presented in the figures in the next section, grouped by category for each animal. The relative importance of each item within a group of beliefs can be seen for both diet pledges and petition signatures. We also discuss the top-performing individual beliefs across the categories. In general, average correlations for the beliefs in each category were
small (< .20), with each category of beliefs showing similar correlations with diet pledges and petition signatures.

### Table 1: Average Correlations With Pro-Animal Behavior (Overall Rankings)

#### Correlation with Taking a Fish Diet Pledge (Strongest to Weakest)

1. Fish Emotions Beliefs
2. Fish Social Beliefs
3. Fish Personality Beliefs
4. Fish Intelligence Beliefs
5. Fish Suffering Beliefs
6. Other Fish Beliefs
7. Fish Consumption Beliefs

#### Correlation with Signing a Fish Welfare Petition (Strongest to Weakest)

1. Fish Emotions Beliefs
2. Other Fish Beliefs
3. Fish Personality Beliefs
4. Fish Social Beliefs
5. Fish Intelligence Beliefs
6. Fish Suffering Beliefs
7. Fish Consumption Beliefs

#### Correlation with Taking a Chicken Diet Pledge (Strongest to Weakest)

1. Chicken Emotions Beliefs
2. Chicken Personality Beliefs
3. Chicken Suffering Beliefs
4. Chicken Intelligence Beliefs
5. Other Chicken Beliefs
6. Chicken Consumption Beliefs
7. Chicken Social Beliefs

#### Correlation with Signing a Chicken Welfare Petition (Strongest to Weakest)

1. Chicken Emotions Beliefs
2. Chicken Personality Beliefs
3. Chicken Suffering Beliefs
4. Other Chicken Beliefs
5. Chicken Social Beliefs
6. Chicken Intelligence Beliefs
7. Chicken Consumption Beliefs

*Notes.* Given the ordinal nature of the beliefs scale, Spearman rank-order correlations were used for all belief correlations.
Beliefs about Fishes

Belief categories are presented in order of the size of their average correlation with taking the diet pledge.

*Fish Emotions Beliefs*

Beliefs related to fish emotions showed the largest average correlation with taking the diet pledge ($r = .16$, $SD = .09$) and signing the petition ($r = .18$, $SD = .02$) out of all the categories of beliefs. In other words, people who believe that fishes experience emotions were more likely to take the diet pledge and sign the welfare petition. All three emotion-related beliefs were associated with animal-positive behaviors, but the strongest relationship was between the belief that fishes can feel positive emotions like pleasure and willingness to take the diet pledge or sign the welfare petition.

Because of the relatively strong correlations in the fish emotions category, advocates should consider focusing on this type of belief when asking individuals to take a diet pledge or sign a welfare petition.
Fish Social Beliefs

Beliefs about the social nature of fishes had the second highest average correlation with taking the diet pledge ($r = .15$, SD = .02) and the fourth highest with signing the welfare petition ($r = .11$, SD = .09). Individuals who believe fishes can communicate with each other were more likely to both take the diet pledge and sign the petition. However, those who believe that fishes don’t care for their young were less likely to take the diet pledge.
Figure 5: Fish Social Beliefs And Animal-Positive Behaviors

Fish Personality Beliefs

Fish personality beliefs had the third highest average correlation with both taking the diet pledge ($r = .13$, $SD = .05$) and signing the petition ($r = .12$, $SD = .06$). Individuals were more likely to take the diet pledge if they believe that fishes are loving, can bond with humans, or play. Signing the welfare petition was associated with the beliefs that fishes are curious, loving, or play. Those
who believe that fishes have no personality were less likely to take both actions, suggesting that advocates would benefit from emphasizing that fishes do have personalities and highlighting positive traits like curiosity, lovingness, and playfulness.

**Figure 6: Fish Personality Beliefs And Animal-Positive Behaviors**

Beliefs related to the intelligence of fishes had the fourth highest average correlation with willingness to take the diet pledge ($r = .12$, SD = .06) and the third lowest with signing the

**Fish Intelligence Beliefs**

Beliefs related to the intelligence of fishes had the fourth highest average correlation with willingness to take the diet pledge ($r = .12$, SD = .06) and the third lowest with signing the
welfare petition ($r = .11, SD = .09$). Individuals were more likely to take both actions if they believe that fishes are more intelligent than people give them credit for and that fishes can learn. Those who believe that fishes have a lower IQ than most animals were less likely to take the diet pledge.

**Figure 7: Fish Intelligence Beliefs And Animal-Positive Behaviors**

Note: ** indicates that the correlation with petition signatures was significant. *** indicates that the correlation with diet pledges was significant.
**Fish Suffering Beliefs**

Fish suffering beliefs had the third lowest average correlation with taking the diet pledge ($r = .10$, $SD = .06$) and the second lowest with signing the petition ($r = .10$, $SD = .04$). Individuals who believe big fish farms are gross were more likely to take the diet pledge. The same is true for those who believe fishes can feel pain and that they need room to explore and exercise. Individuals who believe that fishes need room to explore and exercise were more likely to sign the welfare petition as well, as were those who believe that most farmed fishes are raised inhumanely and those who believe that fishes can feel pain.

Informed by these findings, advocates may have success when emphasizing the inhumane or gross conditions of fish farms. When discussing the barren or crowded nature of these farms, advocates may find success when highlighting the specific issues this causes, such as lack of exercise and exploration, to paint a clearer picture of the conditions.
"Other" fish beliefs had the second lowest average correlation with taking the diet pledge (r = .08, SD = .06), but the second highest with signing the welfare petition (r = .13, SD = .04). People who believe that fishes are contaminated with plastics, heavy metals, and chemicals were more likely to take the diet pledge and to sign the welfare petition. Individuals were also more likely to sign the petition if they believe that fishes are beautiful. In contrast, those who believe that fishes are gross were less likely to sign the petition.
Advocates may wish to focus on the beauty of fishes when seeking petition signatures, as it may appeal to those who already believe they are beautiful or help shift the perceptions of those who believe they are gross.

**Figure 9: Other Fish Beliefs And Animal-Positive Behaviors**

![Graph showing correlation between fish beliefs and animal-positive behaviors.]

Fish Consumption Beliefs

Notes: * indicates that the correlation with petition signatures was significant. ** indicates that the correlation with diet pledges was significant.
The lowest average correlation with both taking the diet pledge ($r = .04, \text{SD} = .03$) and signing the welfare petition ($r = .07, \text{SD} = .03$) was found for beliefs about consuming fish. However, individuals who believe that eating fish doesn’t contribute as much to climate change as eating other animals were less likely to take the diet pledge. People who believe that fish products labeled “sustainable” come from fishes with good welfare or who believe that fishes are a good source of protein were more likely to sign the welfare petition.

Because of the comparatively low correlations between fish consumption beliefs and animal-positive behaviors, advocates may find more success exploring other categories of messaging, such as the emotional traits of fishes.
Figure 10: Fish Consumption Beliefs And Animal-Positive Behaviors

Beliefs about Chickens
Belief categories are presented in order of the size of their average correlation with taking the diet pledge.

Chicken Emotions Beliefs
Beliefs related to chickens' emotions had the highest average correlation with both taking the diet pledge \((r = .17, \text{ SD } = .01)\) and signing the welfare petition \((r = .17, \text{ SD } = .01)\). All three emotional beliefs—chickens can feel positive emotions like pleasure, chickens can feel negative emotions like pain, and chickens can feel stress—were associated with both taking the diet pledge and signing the petition. This suggests that advocates may find success with various types of appeals that focus on chickens’ ability to experience emotions of any sort.

**Figure 11: Chicken Emotion Beliefs And Animal-Positive Behaviors**
**Chicken Personality Beliefs**

Beliefs related to chickens’ personalities had the second highest average correlation with both taking the diet pledge ($r = .16$, SD = .08) and signing the welfare petition ($r = .16$, SD = .04). Individuals who believe that chickens are loving, play, or can bond with humans were more likely to take the diet pledge, while those who believe chickens can bond with humans, are loving, or are curious were more likely to sign the welfare petition. Highlighting any or all of these qualities could be a fruitful approach for advocates seeking either animal-positive behavior.

**Figure 12: Chicken Personality Beliefs And Animal-Positive Behaviors**

Note: ‘*’ indicates that the correlation with petition signatures was significant. ‘**’ indicates that the correlation with diet pledges was significant.
**Chicken Suffering Beliefs**

The third highest average correlations for both taking the diet pledge ($r = .12$, SD = .06) and signing the welfare petition ($r = .14$, SD = .04) were with beliefs related to chicken suffering. In both cases, individuals were more likely to take an animal-positive action if they believe that most chickens are raised inhumanely, many of the farms that produce chickens have horrible living conditions, or that chickens need room to explore and exercise. The belief that most chickens are raised inhumanely was particularly strongly associated with diet pledges.

These results suggest that advocates may find success when specifically highlighting the poor or inhumane conditions of chicken farms and how they can limit chickens’ ability to engage in natural activities such as exploration and exercise.
Figure 13: Chicken Suffering Beliefs And Animal-Positive Behaviors

**Chicken Intelligence Beliefs**

Chicken intelligence beliefs had the fourth highest average correlation with taking the diet pledge ($r = .11$, $SD = .07$) and the second lowest with signing the petition ($r = .11$, $SD = .10$). In both cases, the belief that chickens are more intelligent than people give them credit for had the strongest association with pro-animal behavior. People were also more likely to take both actions if they believe that chickens can learn. Advocates may have more success highlighting
the intelligence of chickens and their ability to learn rather than comparing chickens to other animals.

**Figure 14: Chicken Intelligence Beliefs And Animal-Positive Behaviors**

![Diagram](image)

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**Other Chicken Beliefs**

"Other" chicken beliefs had the third lowest average correlation with taking the diet pledge ($r = .09$, SD = .10) and the fourth highest with signing the welfare petition ($r = .11$, SD = .09). People
who believe that chickens are beautiful were more likely to take the pledge and sign the petition, while those who believe that chickens are gross were less likely to sign the petition.

**Figure 15: Other Chicken Beliefs And Animal-Positive Behaviors**

**Chicken Consumption Beliefs**

Beliefs related to chicken consumption had the second lowest average correlation with taking the diet pledge \((r = 0.05, SD = 0.04)\) and the lowest with signing the welfare petition \((r = 0.03, SD = 0.03)\). People who believe that chicken products labeled “organic” come from chickens with good
welfare were more likely to take the diet pledge, while those who don’t believe that eating chickens contributes to climate change as much as eating other animals were less likely to take the diet pledge. There were no particularly strong associations with signing the welfare petition. Because of the comparatively weak associations between chicken consumption beliefs and animal-positive actions, advocates may find more success focusing on other categories of beliefs about chickens, such as their emotions, personalities, and suffering on farms.

Figure 16: Chicken Consumption Beliefs And Animal-Positive Behaviors
**Chicken Social Beliefs**

Beliefs related to the social nature of chickens had the lowest average correlation with taking the diet pledge (r = .04, SD = .03) and the third lowest with signing the welfare petition (r = .11, SD = .00). While people who believe that chickens can communicate with each other were more likely to sign the welfare petition, those who believe that chickens don’t care for their young were less likely to do so. There were no notable associations between social beliefs and taking the diet pledge.

**Figure 17: Chicken Consumption Beliefs And Animal-Positive Behaviors**

Note: ** indicates that the correlation with petition signatures was significant. *** indicates that the correlation with diet pledges was significant.
What Role Did Participant Traits Play?

Table 2 shows the rates of each pro-animal behavior for demographic groups that showed significant differences using a chi-square test of independence. Trends within ordinal variables were also identified using simple logistic regressions. These characteristics include age, income, education, and frequency of fish and chicken consumption. More detailed results can be found in the Supplementary Materials.

- Gender: Men were less likely than women or other genders to take the chicken diet pledge, but there were no other gender-based differences.
- Race: Those who identified as white were less likely to take the chicken diet pledge than people of other races.
- Age: In general, younger people were more likely to take the chicken diet pledge than older ones. The same was true for the fish diet pledge. The opposite trend was true for petitions: older people were more likely to sign both the fish petition and the chicken petition than younger people.
- No clear relationships were found between income and pro-animal behaviors.
- No clear relationships were found between education and pro-animal behaviors.
- Region: Regional differences can be seen for fish petition signatures, for which participants from the Prairie provinces were less likely to sign than people from other regions. Regional differences also show up in willingness to take the chicken diet pledge: people from the Atlantic and Prairie provinces were less likely to take it than other regions, while participants in Central Canada were more likely to take it.
- Guardians of companion animals were more likely to take both pro-fish actions and to take the chicken diet pledge, compared to non-guardians.
- Recent fish consumption: Participants who consumed fish more frequently were more likely to sign the fish petition than those who consumed it less frequently.
- Recent chicken consumption: Participants who consumed chicken more frequently were less likely to take the chicken diet pledge than those who consumed it less frequently.

As a note, people who already abstained entirely from eating fish or chicken were not offered the diet pledge for that animal.

In addition to the characteristics shown discussed above, we looked for differences based on whether participants had fished or handled chickens recently. There were no significant differences between groups, which means that the overall percentages should be used for all groups to avoid over-interpretation of non-significant differences. As a reminder, those percentages were as follows: 39% of participants took the diet pledge to reduce their consumption of fish and 37% agreed to reduce their consumption of chicken. 44% of participants agreed to sign the fish welfare petition, and 47% agreed to sign the chicken welfare petition.
Table 2: Percent Who Took the Diet Pledge or Signed the Petition Based on Group Membership

| Notes | An asterisk (*) indicates that there was a statistically significant difference between groups. For details on how these analyses were conducted, see the Supplementary Materials. |

Conclusions
This study has added substantially to our body of knowledge regarding public beliefs about chickens and fishes in Canada and how they relate to animal-positive actions.

Overall, 44% of participants agreed to sign the fish welfare petition, and 47% agreed to sign the chicken welfare petition. Participants were somewhat less likely to commit to dietary change, with 39% of participants taking the pledge to reduce their consumption of fish and 37% agreeing to reduce their consumption of chicken. For both fishes and chickens, the majority of pledgers—77% for fishes and 66% for chicken—agreed to eat fish or chicken meat less than once per week. Still, only 5% of participants who took the chicken pledge and 9% who took the fish pledge agreed to eliminate their consumption entirely. These results show that a sizable portion of the Canadian population may be willing to commit to take animal-positive action that is not overly costly.

Which Beliefs Were Most Common?
The relative prevalence of various beliefs are summarized in Figures 1 and 2. A notable takeaway is that participants generally had more positive views of chickens than they did of fishes. For instance, more participants believed chickens to be capable of curiosity and feeling positive and negative emotions like pleasure and fear than they did for fish. As research
indicates that fishes also demonstrate these capabilities, this suggests fishes face additionally prejudiced views (Faunalytics, 2016; Faunalytics, 2020).

However, while participants had more positive views of chickens, they were less likely to sign the chicken welfare petition and take the chicken dietary pledge than they were to sign the fish petition and pledge to reduce their fish consumption. One possible explanation for this unintuitive result is that Canadians’ willingness to take a diet pledge or sign a welfare petition may be largely driven by factors other than their views about an animal. For instance, attachment to eating each type of meat may play a role.

The prevalence of various beliefs can serve as useful guides for animal advocates when designing advocacy and awareness campaigns. For instance, animal advocates may wish to emphasize aquaculture water quality issues and the beauty of fish in the data, images, or videos used in ask-based campaigns for fish welfare, as these beliefs were both prevalent and associated with animal-positive behavior. Other beliefs, such as fishes being able to feel positive emotions like pleasure, or chickens being loving, were less common, but were nonetheless more strongly correlated with animal-positive behaviors than more common beliefs. Such beliefs are prime candidates for informational campaigns seeking to inspire greater concern for animals among the public.

In general, understanding the prevalence of various beliefs can help advocates target efforts based on where most people currently stand.

Beliefs Most Strongly Associated With Pro-Animal Behavior

Groups of Beliefs

Our calculations of the average correlation of the items in each group of beliefs, as well as the effect sizes displayed in Figures 3-16, can help advocates understand which groups of beliefs are most strongly associated with animal-positive behavior. For both chickens and fishes, beliefs about emotions and personality were more strongly correlated with animal-positive behavior than most other categories of beliefs were. Conversely, consumption-related beliefs consistently had weak associations with willingness to sign the petition or take the diet pledge. For fish in particular, social beliefs were more strongly correlated with taking a fish diet pledge, while beliefs surrounding fish beauty were more strongly associated with signing the welfare petition.

These results suggest that emphasizing the emotions and personality of chicken and fish in advocacy may yield more petition signatures and dietary pledges. Additionally, highlighting the suffering experienced on factory farms may work well for chicken campaigns, while focusing on beauty may work better for fish campaigns. Indeed, appealing to these beliefs in advocacy campaigns may prove highly effective, as chicken suffering beliefs and fish beauty beliefs were also prevalent among the study participants.
Beliefs related to the consumption of fishes or chickens consistently had weak associations with pro-animal behaviors. In other words, advocates should avoid focusing on these beliefs. A notable exception is the belief that chicken consumption doesn’t contribute as much to climate change as eating other animals. People who held this belief were less likely to take the chicken pledge. While chickens do contribute fewer greenhouse gas emissions per pound than beef or pork, their emissions are higher than legumes such as beans and lentils (Environmental Working Group, 2011). Noting such disparities in greenhouse gas emissions could be an effective strategy for shifting the beliefs of climate conscious chicken consumers.

It is important to note that ranking belief groups according to average correlations has its limitations. The individual beliefs within a group of beliefs are not always associated with behavior in the same way or to the same extent. For any beliefs advocates are considering using, we suggest paying closer attention to the strength and direction of correlation for each individual belief than to the average correlation for the overall group.

**Individual Beliefs**

For both chickens and fishes, believing that they can experience positive emotions, that they can engage in play, that they can bond with humans, and that they are loving, were among the most strongly associated with animal-positive behavior. Given that these beliefs were not among the most widely held for both species, informational advocacy on fishes’ and chickens’ capacity for pleasure, play, and emotional relationships may be a way to nudge individuals toward taking actions on their behalf. This is further supported by the negative correlations observed for the beliefs that chicken and fish have no personality.

Participants who believed chickens and fishes can experience negative emotions like fear and stress were more likely to commit to a dietary pledge and sign the welfare petition. These beliefs were also more common than the belief that chickens and fishes can experience positive emotions such as pleasure. Beliefs regarding chickens and fishes being raised in poor conditions, such as being raised inhumanely or living in horrible conditions, were also among the beliefs with the strongest pro-animal correlations. However, although around 80% of participants believed that chickens and fishes need room to explore and exercise, just 56% and 50% of participants believed chickens and fishes are often raised in horrible conditions, respectively, with even fewer believing they are frequently raised inhumanely. This may mean that many participants do not connect a lack of space with inhumane conditions. Given that prevalent beliefs around chickens’ and fishes’ capacity for pain, stress, and other negative emotions are also associated with animal-positive behavior, emphasizing the emotional suffering chickens and fishes can experience—as well as the association between crowded conditions and suffering—may persuade more people to sign welfare petitions or take diet pledges.

The beauty and intelligence of chickens and fishes also stood out among individual beliefs for their notable correlations with chicken diet pledges, chicken petition signatures, and fish petition signatures. Although these characteristics are not directly related to the welfare of animals,
some research has shown that emotional reactions—like the feeling someone could get from seeing a particularly beautiful or intelligent animal—can have an effect on judgments and decision-making (Angie et al., 2011). Contrasting the beauty and intelligence of an animal with the reality on industrial farms could be an effective strategy for encouraging pro-animal behavior. For instance, advocates could compare images of wild rainbow trout with those raised on farms, or complex chicken relationships in the wild with the brutal nature of chicken growing houses.

The belief that fish farms are gross had one of the strongest associations with taking the fish diet pledge. Believing chicken farms were gross was also associated with pro-chicken behavior, although not as strongly. While participants may associate grossness more with health, food safety, and quality concerns than with welfare concerns, advocates can strategically appeal to these beliefs to encourage reductions in fish consumption. For example, advocates could inform the public about the toxin content in fishes raised on farms. This approach is also supported by the association between the belief that fishes are contaminated with pollutants and fish positive behaviors. Such strategies may even be effective at shifting beliefs regarding fish welfare. Research shows that people tend to form their beliefs in the present moment to agree or justify past behavior (Albarracin & Wyer, 2000). Reducing meat consumption—even for self-interested reasons—may therefore make people more prone to adopting animal-positive beliefs.

Finally, we observe that believing “sustainable” fish comes from fishes with good welfare is positively related to signing the welfare petition, but less so to pledging to reduce one’s fish consumption. This suggests that some people may be influenced to sign fish welfare petitions due to perceived sustainability gains. Advocates could consider taking advantage of this association by noting the environmental benefits of improved fish welfare.

**Participant Characteristics**

This study also allowed us to examine differences in willingness to sign welfare petitions and commit to diet pledges across participant characteristics, as summarized in Table 2. These insights can help advocates understand which social groups to target to increase the number of individuals taking animal-positive action.

We find that men were less likely to pledge to reduce their chicken consumption than women or other genders, but that differences between the genders in petitioning and fish dietary pledging rates were insignificant.

There were few significant differences in the proportion of diet pledges or petition signatures across race. However, white participants were significantly less likely to take the chicken diet pledge than participants of color. This suggests that conducting more outreach to communities of color, who have historically been underrepresented in animal advocacy (Encompass Movement, 2021), may be an effective approach for advocates seeking to reduce chicken consumption.
We did not find clear differential trends in pro-animal behaviors across income or education levels. As such, advocates should not ignore lower income or less educated communities in their efforts.

Surprisingly, participants who ate fish more regularly were more likely to sign the fish welfare petition. However, they were also less likely to take the fish dietary pledge. More research is required to understand this outcome. One possible explanation is that these participants associate better living and slaughter conditions with higher quality fish.

Future Directions

Although this research provides useful guidelines for chicken and fish welfare advocacy, more research is required to understand whether these beliefs are a cause of animal-positive behaviors, or whether they are merely associated with them. In a continuation of this line of research, we will also be testing interventions that will attempt to use some of the beliefs that appear most important based on this research to understand whether shifting these beliefs can increase animal-positive behaviors. This will take the form of an experiment (randomized controlled trial), where different groups of people are shown an intervention that targets specific beliefs to see if any of them influence animal-positive behaviors.

Supplementary Materials

Method: Additional Details

Participants and Power

Participants were recruited using a panel company called CINT. In keeping with Faunalytics’ Data Quality Assurance Plan, we performed data checks to screen out answers that may be fraudulent or participants who fail attention checks.

Responses that showed poor data quality or the failure of attention-check questions were excluded. After removing participants in the data cleaning process, we had a total of 664 participants in the fish condition and 675 in the chicken condition. Power analyses indicated that a sample size of 497 per animal would allow for the detection of a small-to-medium effect size (rho = .16) with a power of .95 in a point-biserial correlation (critical t = 1.96), so we were well-powered for our goals. For additional details on the measures, power analysis, analysis plan, and more, please see the pre-registration documents on the Open Science Framework.
<table>
<thead>
<tr>
<th>Table 3: Participants Traits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
</tr>
<tr>
<td>Woman or Other</td>
</tr>
<tr>
<td>Man</td>
</tr>
<tr>
<td><strong>Race</strong></td>
</tr>
<tr>
<td>Caucasian/White</td>
</tr>
<tr>
<td>Asian or Asian-Canadian</td>
</tr>
<tr>
<td>Other</td>
</tr>
<tr>
<td><strong>Age Group</strong></td>
</tr>
<tr>
<td>18-24</td>
</tr>
<tr>
<td>25-34</td>
</tr>
<tr>
<td>35-44</td>
</tr>
<tr>
<td>45-54</td>
</tr>
<tr>
<td>55-64</td>
</tr>
<tr>
<td>65+</td>
</tr>
<tr>
<td><strong>Income</strong></td>
</tr>
<tr>
<td>Less than $25,000</td>
</tr>
<tr>
<td>$25,000 to $49,999</td>
</tr>
<tr>
<td>$50,000 to $74,999</td>
</tr>
<tr>
<td>$75,000 to $99,999</td>
</tr>
<tr>
<td>$100,000 or more</td>
</tr>
<tr>
<td><strong>Education</strong></td>
</tr>
<tr>
<td>Less than high school graduate</td>
</tr>
<tr>
<td>High school graduate</td>
</tr>
<tr>
<td>Some college or university, no degree</td>
</tr>
<tr>
<td>Associate's degree or college diploma</td>
</tr>
<tr>
<td>Bachelor's degree</td>
</tr>
<tr>
<td>Master's degree</td>
</tr>
<tr>
<td>Professional or doctoral degree</td>
</tr>
<tr>
<td><strong>Region</strong></td>
</tr>
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<td>Atlantic Provinces</td>
</tr>
<tr>
<td>Central Canada</td>
</tr>
<tr>
<td>Prairie Provinces</td>
</tr>
<tr>
<td>British Columbia</td>
</tr>
<tr>
<td>Northern Territories</td>
</tr>
<tr>
<td><strong>Companion Animals</strong></td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td><strong>Went Fishing</strong></td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td><strong>Handled Chickens</strong></td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td><strong>Fish Consumption</strong></td>
</tr>
<tr>
<td>Never</td>
</tr>
<tr>
<td>Less than once per week</td>
</tr>
<tr>
<td>1-3 times per week</td>
</tr>
<tr>
<td>4-6 times per week</td>
</tr>
<tr>
<td>1 or more times per day</td>
</tr>
<tr>
<td><strong>Chicken Consumption</strong></td>
</tr>
<tr>
<td>Never</td>
</tr>
<tr>
<td>Less than once per week</td>
</tr>
<tr>
<td>1-3 times per week</td>
</tr>
<tr>
<td>4-6 times per week</td>
</tr>
<tr>
<td>1 or more times per day</td>
</tr>
</tbody>
</table>
Correlational Analyses

Spearman rank-order correlations were used for analyses because the outcome variables were dichotomous and beliefs were rated on a Likert scale. They can be interpreted the same way as standard Pearson correlations. The scores range from -1 to 1, with scores further away from zero indicating a stronger relationship between the variables in question. It is also an indication of effect size.

Petition Measure

For consistency with the first report in this line of research, the petition outcome variable is measured using agreement to sign the welfare petition rather than whether participants clicked the link to the petition.

Participant Traits Analyses

For our analysis of participant traits, all of which were categorical, we used chi-square tests of independence to test for differences across levels of each trait category. For ordinal variables, we used simple logistic regressions to determine trends.

When conducting chi-square tests on tables with cells containing expected values below 5, Monte Carlo simulations were necessarily used to compute p-values.

Table 4: Summarized Chi-Square Results

<table>
<thead>
<tr>
<th>IV</th>
<th>Fish Diet Pledge</th>
<th>Fish Petition Signature</th>
<th>Chicken Diet Pledge</th>
<th>Chicken Petition Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\chi^2$</td>
<td>p-value</td>
<td>$\chi^2$</td>
<td>p-value</td>
</tr>
<tr>
<td>Gender</td>
<td>0.10</td>
<td>0.75</td>
<td>1.25</td>
<td>0.26</td>
</tr>
<tr>
<td>Race</td>
<td>3.06</td>
<td>0.22</td>
<td>2.05</td>
<td>0.36</td>
</tr>
<tr>
<td>Age Group</td>
<td>9.02</td>
<td>0.11</td>
<td>15.27</td>
<td>0.01</td>
</tr>
<tr>
<td>Income</td>
<td>10.13</td>
<td>0.04</td>
<td>2.07</td>
<td>0.32</td>
</tr>
<tr>
<td>Education</td>
<td>4.87</td>
<td>0.56</td>
<td>1.96</td>
<td>0.25</td>
</tr>
<tr>
<td>Region</td>
<td>1.99</td>
<td>0.57</td>
<td>9.43</td>
<td>0.00</td>
</tr>
<tr>
<td>Companion Animals</td>
<td>4.60</td>
<td>0.03</td>
<td>7.61</td>
<td>0.01</td>
</tr>
<tr>
<td>Went Fishing</td>
<td>2.96</td>
<td>0.05</td>
<td>1.62</td>
<td>0.20</td>
</tr>
<tr>
<td>Held Chickens</td>
<td>2.12</td>
<td>0.14</td>
<td>3.16</td>
<td>0.08</td>
</tr>
<tr>
<td>Fish Consumption</td>
<td>10.44</td>
<td>0.03</td>
<td>8.39</td>
<td>0.08</td>
</tr>
<tr>
<td>Chicken Consumption</td>
<td>6.61</td>
<td>0.16</td>
<td>5.69</td>
<td>0.22</td>
</tr>
</tbody>
</table>

Table 5: Summarized Logistic Regression Results

<table>
<thead>
<tr>
<th>IV</th>
<th>Fish Diet Pledge</th>
<th>Fish Petition Signature</th>
<th>Chicken Diet Pledge</th>
<th>Chicken Petition Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>$\beta$</td>
<td>p-value</td>
<td>$\beta$</td>
<td>p-value</td>
</tr>
<tr>
<td>Age</td>
<td>-0.01</td>
<td>0.02</td>
<td>0.01</td>
<td>0.03</td>
</tr>
<tr>
<td>Income</td>
<td>-0.03</td>
<td>0.61</td>
<td>-0.04</td>
<td>0.44</td>
</tr>
<tr>
<td>Education</td>
<td>0.07</td>
<td>0.21</td>
<td>0.02</td>
<td>0.66</td>
</tr>
<tr>
<td>Fish Consumption</td>
<td>-0.12</td>
<td>0.09</td>
<td>0.21</td>
<td>0.04</td>
</tr>
<tr>
<td>Chicken Consumption</td>
<td>-0.13</td>
<td>0.28</td>
<td>0.03</td>
<td>0.75</td>
</tr>
</tbody>
</table>
Average Correlation by Group of Beliefs

The average correlation for each group of beliefs are shown in Table 6 for fishes and Table 7 for chickens. These were also provided in text in the body of the report.

To get these numbers, we averaged the absolute value of each of the correlations for the items in a group for each of the outcome variables. Because the number of responses used for each correlation was approximately the same, this “average of averages” approach does not weight any correlation unduly.

Table 6: Average Correlation of Fish Beliefs by Category

<table>
<thead>
<tr>
<th>Belief Category</th>
<th>Correlation Average</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish emotions beliefs and diet pledge</td>
<td>0.16</td>
<td>0.09</td>
</tr>
<tr>
<td>Fish emotions beliefs and petition</td>
<td>0.18</td>
<td>0.02</td>
</tr>
<tr>
<td>Fish social beliefs and diet pledge</td>
<td>0.15</td>
<td>0.02</td>
</tr>
<tr>
<td>Fish social beliefs and petition</td>
<td>0.11</td>
<td>0.09</td>
</tr>
<tr>
<td>Fish personality beliefs and diet pledge</td>
<td>0.13</td>
<td>0.05</td>
</tr>
<tr>
<td>Fish personality beliefs and petition</td>
<td>0.12</td>
<td>0.06</td>
</tr>
<tr>
<td>Fish intelligence beliefs and diet pledge</td>
<td>0.12</td>
<td>0.06</td>
</tr>
<tr>
<td>Fish intelligence beliefs and petition</td>
<td>0.11</td>
<td>0.09</td>
</tr>
<tr>
<td>Fish suffering beliefs and diet pledge</td>
<td>0.10</td>
<td>0.06</td>
</tr>
<tr>
<td>Fish suffering beliefs and petition</td>
<td>0.10</td>
<td>0.04</td>
</tr>
<tr>
<td>Other fish beliefs and diet pledge</td>
<td>0.08</td>
<td>0.06</td>
</tr>
<tr>
<td>Other fish beliefs and petition</td>
<td>0.13</td>
<td>0.04</td>
</tr>
<tr>
<td>Fish consumption beliefs and diet pledge</td>
<td>0.04</td>
<td>0.03</td>
</tr>
<tr>
<td>Fish consumption beliefs and petition</td>
<td>0.07</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Table 7: Average Correlation of Chicken Beliefs by Category

<table>
<thead>
<tr>
<th>Belief Category</th>
<th>Correlation Average</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicken emotions beliefs and diet pledge</td>
<td>0.17</td>
<td>0.01</td>
</tr>
<tr>
<td>Chicken emotions beliefs and petition</td>
<td>0.17</td>
<td>0.01</td>
</tr>
<tr>
<td>Chicken personality beliefs and diet pledge</td>
<td>0.15</td>
<td>0.08</td>
</tr>
<tr>
<td>Chicken personality beliefs and petition</td>
<td>0.16</td>
<td>0.04</td>
</tr>
<tr>
<td>Chicken suffering beliefs and diet pledge</td>
<td>0.12</td>
<td>0.06</td>
</tr>
<tr>
<td>Chicken suffering beliefs and petition</td>
<td>0.14</td>
<td>0.04</td>
</tr>
<tr>
<td>Chicken intelligence beliefs and diet pledge</td>
<td>0.11</td>
<td>0.07</td>
</tr>
<tr>
<td>Chicken intelligence beliefs and petition</td>
<td>0.11</td>
<td>0.10</td>
</tr>
<tr>
<td>Other chicken beliefs and diet pledge</td>
<td>0.09</td>
<td>0.10</td>
</tr>
<tr>
<td>Other chicken beliefs and petition</td>
<td>0.11</td>
<td>0.09</td>
</tr>
<tr>
<td>Chicken consumption beliefs and diet pledge</td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td>Chicken consumption beliefs and petition</td>
<td>0.03</td>
<td>0.03</td>
</tr>
<tr>
<td>Chicken social beliefs and diet pledge</td>
<td>0.04</td>
<td>0.03</td>
</tr>
<tr>
<td>Chicken social beliefs and petition</td>
<td>0.11</td>
<td>0.00</td>
</tr>
</tbody>
</table>
As noted in the Results section, beliefs around the emotions and social nature of fishes were the categories most strongly associated with diet pledges. Beliefs around fish emotions were most strongly associated with petition signatures.

For chickens, the emotion and personality groups of beliefs were most strongly associated with both pledges and petition signatures.

**Individual Beliefs**
Table 8 and Table 9 below contain the correlation results for all individual beliefs. By default, the beliefs with the strongest average association with the two outcome variables are at the top of the table. The “Mean” column contains a zero-centered average of the 7-point Likert scale used for each belief.
### Table 8: Individual Fish Beliefs

<table>
<thead>
<tr>
<th>Belief</th>
<th>Conceptual Category</th>
<th>Mean</th>
<th>SD</th>
<th>Pledge Correlation</th>
<th>Petition Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish can feel positive emotions like pleasure</td>
<td>Emotions</td>
<td>0.41</td>
<td>1.35</td>
<td>0.25*</td>
<td>0.21*</td>
</tr>
<tr>
<td>Fish are loving</td>
<td>Personality</td>
<td>0.15</td>
<td>1.34</td>
<td>0.20*</td>
<td>0.17*</td>
</tr>
<tr>
<td>Fish can learn</td>
<td>Intelligence</td>
<td>0.82</td>
<td>1.33</td>
<td>0.16*</td>
<td>0.20*</td>
</tr>
<tr>
<td>Fish are more intelligent than people give them credit for</td>
<td>Intelligence</td>
<td>0.69</td>
<td>1.44</td>
<td>0.18*</td>
<td>0.17*</td>
</tr>
<tr>
<td>Fish can communicate with each other</td>
<td>Social</td>
<td>1.38</td>
<td>1.17</td>
<td>0.17*</td>
<td>0.17*</td>
</tr>
<tr>
<td>Fish can feel negative emotions like fear</td>
<td>Emotions</td>
<td>0.88</td>
<td>1.41</td>
<td>0.15*</td>
<td>0.17*</td>
</tr>
<tr>
<td>Fish need room to explore and exercise</td>
<td>Suffering</td>
<td>1.39</td>
<td>1.29</td>
<td>0.14*</td>
<td>0.16*</td>
</tr>
<tr>
<td>Fish can feel pain</td>
<td>Suffering</td>
<td>1.36</td>
<td>1.38</td>
<td>0.16*</td>
<td>0.14*</td>
</tr>
<tr>
<td>Big fish farms are gross</td>
<td>Suffering</td>
<td>0.48</td>
<td>1.51</td>
<td>0.19*</td>
<td>0.11*</td>
</tr>
<tr>
<td>Fish can bond with humans</td>
<td>Personality</td>
<td>0.16</td>
<td>1.50</td>
<td>0.16*</td>
<td>0.14*</td>
</tr>
<tr>
<td>Fish are curious</td>
<td>Personality</td>
<td>1.07</td>
<td>1.29</td>
<td>0.12*</td>
<td>0.17*</td>
</tr>
<tr>
<td>Most farmed fish are raised inhumanely</td>
<td>Suffering</td>
<td>0.29</td>
<td>1.42</td>
<td>0.14*</td>
<td>0.15*</td>
</tr>
<tr>
<td>Fish play</td>
<td>Personality</td>
<td>0.92</td>
<td>1.33</td>
<td>0.14*</td>
<td>0.14*</td>
</tr>
<tr>
<td>Fish are beautiful</td>
<td>Other</td>
<td>1.58</td>
<td>1.20</td>
<td>0.07</td>
<td>0.18*</td>
</tr>
<tr>
<td>Fish are contaminated with plastics, heavy metals, and chemicals</td>
<td>Other</td>
<td>1.17</td>
<td>1.34</td>
<td>0.14*</td>
<td>0.11*</td>
</tr>
<tr>
<td>Fish can feel stress</td>
<td>Emotions</td>
<td>1.21</td>
<td>1.34</td>
<td>0.08*</td>
<td>0.16*</td>
</tr>
<tr>
<td>Fish have no personality</td>
<td>Personality</td>
<td>-0.46</td>
<td>1.49</td>
<td>-0.12*</td>
<td>-0.11*</td>
</tr>
<tr>
<td>Fish don’t care for their young</td>
<td>Social</td>
<td>-0.63</td>
<td>1.51</td>
<td>-0.14*</td>
<td>-0.05</td>
</tr>
<tr>
<td>If fish products are labelled “sustainable,” they come from fish with good welfare</td>
<td>Consumption</td>
<td>0.30</td>
<td>1.26</td>
<td>0.05</td>
<td>0.12*</td>
</tr>
<tr>
<td>Many of the farms that produce fish have horrible living conditions</td>
<td>Suffering</td>
<td>0.57</td>
<td>1.42</td>
<td>0.09*</td>
<td>0.08*</td>
</tr>
<tr>
<td>Fish don’t care about being overcrowded</td>
<td>Suffering</td>
<td>-1.03</td>
<td>1.55</td>
<td>-0.05</td>
<td>-0.09*</td>
</tr>
<tr>
<td>Fish have a lower IQ than most animals</td>
<td>Intelligence</td>
<td>0.18</td>
<td>1.26</td>
<td>-0.11*</td>
<td>-0.02</td>
</tr>
<tr>
<td>Fish don’t mind being in a barren environment</td>
<td>Suffering</td>
<td>-0.82</td>
<td>1.44</td>
<td>-0.05</td>
<td>-0.05</td>
</tr>
<tr>
<td>Fish are the healthiest animal to eat</td>
<td>Consumption</td>
<td>0.60</td>
<td>1.30</td>
<td>0.03</td>
<td>0.06</td>
</tr>
<tr>
<td>Fish are gross</td>
<td>Other</td>
<td>-1.28</td>
<td>1.51</td>
<td>0.02</td>
<td>-0.10*</td>
</tr>
<tr>
<td>Fish are the most ethical animal to eat</td>
<td>Consumption</td>
<td>0.15</td>
<td>1.28</td>
<td>0.02</td>
<td>0.05</td>
</tr>
<tr>
<td>Most fish people eat are caught wild in the ocean</td>
<td>Consumption</td>
<td>-0.28</td>
<td>1.52</td>
<td>0.04</td>
<td>0.03</td>
</tr>
<tr>
<td>Fish is a good source of protein</td>
<td>Consumption</td>
<td>1.92</td>
<td>1.08</td>
<td>-0.02</td>
<td>0.08*</td>
</tr>
<tr>
<td>Water quality isn’t that important to fish</td>
<td>Suffering</td>
<td>-2.01</td>
<td>1.40</td>
<td>0.01</td>
<td>-0.06</td>
</tr>
<tr>
<td>Eating fish doesn’t contribute as much to climate change as eating other animals</td>
<td>Consumption</td>
<td>0.06</td>
<td>1.39</td>
<td>-0.09*</td>
<td>0.05</td>
</tr>
<tr>
<td>Individual fish don’t have unique characteristics</td>
<td>Personality</td>
<td>-0.71</td>
<td>1.46</td>
<td>-0.05</td>
<td>0.01</td>
</tr>
<tr>
<td>Fish never find it stressful to be picked up or handled</td>
<td>Suffering</td>
<td>-1.40</td>
<td>1.53</td>
<td>0.03</td>
<td>0.05</td>
</tr>
<tr>
<td>Fish mostly act out of instinct</td>
<td>Intelligence</td>
<td>1.04</td>
<td>1.23</td>
<td>-0.04</td>
<td>0.04</td>
</tr>
</tbody>
</table>

**Notes.** An asterisk (*) indicates a statistically significant correlation.
Table 9: Individual Chicken Beliefs

<table>
<thead>
<tr>
<th>Belief</th>
<th>Conceptual Category</th>
<th>Mean</th>
<th>SD</th>
<th>Pledge Correlation</th>
<th>Petition Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chickens are loving</td>
<td>Personality</td>
<td>0.63</td>
<td>1.28</td>
<td>0.25*</td>
<td>0.19*</td>
</tr>
<tr>
<td>Chickens are more intelligent than people give them credit for</td>
<td>Intelligence</td>
<td>0.88</td>
<td>1.36</td>
<td>0.19*</td>
<td>0.22*</td>
</tr>
<tr>
<td>Chickens play</td>
<td>Personality</td>
<td>0.90</td>
<td>1.28</td>
<td>0.23*</td>
<td>0.17*</td>
</tr>
<tr>
<td>Chickens are beautiful</td>
<td>Other</td>
<td>0.75</td>
<td>1.38</td>
<td>0.21*</td>
<td>0.19*</td>
</tr>
<tr>
<td>Most chickens are raised inhumanly</td>
<td>Suffering</td>
<td>0.60</td>
<td>1.50</td>
<td>0.21*</td>
<td>0.17*</td>
</tr>
<tr>
<td>Chickens can bond with humans</td>
<td>Personality</td>
<td>1.03</td>
<td>1.27</td>
<td>0.17*</td>
<td>0.21*</td>
</tr>
<tr>
<td>Many of the farms that produce chickens have horrible living conditions</td>
<td>Suffering</td>
<td>0.66</td>
<td>1.48</td>
<td>0.18*</td>
<td>0.19*</td>
</tr>
<tr>
<td>Chickens can feel positive emotions like pleasure</td>
<td>Emotions</td>
<td>1.02</td>
<td>1.26</td>
<td>0.17*</td>
<td>0.19*</td>
</tr>
<tr>
<td>Chickens can feel negative emotions like fear</td>
<td>Emotions</td>
<td>1.36</td>
<td>1.24</td>
<td>0.17*</td>
<td>0.16*</td>
</tr>
<tr>
<td>Chickens can feel stress</td>
<td>Emotions</td>
<td>1.51</td>
<td>1.26</td>
<td>0.16*</td>
<td>0.17*</td>
</tr>
<tr>
<td>Chickens need room to explore and exercise</td>
<td>Suffering</td>
<td>1.56</td>
<td>1.19</td>
<td>0.14*</td>
<td>0.18*</td>
</tr>
<tr>
<td>Chickens are curious</td>
<td>Personality</td>
<td>1.37</td>
<td>1.15</td>
<td>0.12*</td>
<td>0.19*</td>
</tr>
<tr>
<td>Chickens can learn</td>
<td>Intelligence</td>
<td>1.12</td>
<td>1.29</td>
<td>0.15*</td>
<td>0.16*</td>
</tr>
<tr>
<td>Big chicken farms are gross</td>
<td>Suffering</td>
<td>0.41</td>
<td>1.53</td>
<td>0.10*</td>
<td>0.15*</td>
</tr>
<tr>
<td>Chickens don’t care about being over-crowded</td>
<td>Suffering</td>
<td>-1.01</td>
<td>1.55</td>
<td>-0.13*</td>
<td>-0.12*</td>
</tr>
<tr>
<td>Chickens can feel pain</td>
<td>Suffering</td>
<td>1.92</td>
<td>1.11</td>
<td>0.11*</td>
<td>0.14*</td>
</tr>
<tr>
<td>Chickens don’t mind being in a barren environment</td>
<td>Suffering</td>
<td>-0.76</td>
<td>1.40</td>
<td>-0.10*</td>
<td>-0.10*</td>
</tr>
<tr>
<td>Chickens have no personality</td>
<td>Personality</td>
<td>-0.91</td>
<td>1.42</td>
<td>-0.08</td>
<td>-0.12*</td>
</tr>
<tr>
<td>Air and water quality aren’t that important to chickens</td>
<td>Suffering</td>
<td>-1.51</td>
<td>1.58</td>
<td>-0.06</td>
<td>-0.11*</td>
</tr>
<tr>
<td>Individual chickens don’t have unique characteristics</td>
<td>Personality</td>
<td>-0.86</td>
<td>1.40</td>
<td>-0.07</td>
<td>-0.11*</td>
</tr>
<tr>
<td>Chickens don’t care for their young</td>
<td>Social</td>
<td>-1.25</td>
<td>1.39</td>
<td>-0.06</td>
<td>-0.11*</td>
</tr>
<tr>
<td>If chicken products are labelled “organic,” they come from chickens with good welfare</td>
<td>Consumption</td>
<td>0.08</td>
<td>1.49</td>
<td>0.09*</td>
<td>0.06</td>
</tr>
<tr>
<td>Chickens can communicate with each other</td>
<td>Social</td>
<td>1.36</td>
<td>1.18</td>
<td>0.02</td>
<td>0.10*</td>
</tr>
<tr>
<td>Chickens are gross</td>
<td>Other</td>
<td>-1.36</td>
<td>1.43</td>
<td>0.02</td>
<td>-0.14*</td>
</tr>
<tr>
<td>Chickens mostly act out of instinct</td>
<td>Intelligence</td>
<td>0.69</td>
<td>1.29</td>
<td>-0.04</td>
<td>-0.04</td>
</tr>
<tr>
<td>Eating chickens doesn’t contribute as much to climate change as eating other animals</td>
<td>Consumption</td>
<td>0.17</td>
<td>1.21</td>
<td>-0.09*</td>
<td>0.01</td>
</tr>
<tr>
<td>Chickens never find it stressful to be picked up or handled</td>
<td>Suffering</td>
<td>-1.10</td>
<td>1.39</td>
<td>-0.02</td>
<td>-0.06</td>
</tr>
<tr>
<td>Chickens have a lower IQ than most animals</td>
<td>Intelligence</td>
<td>-0.17</td>
<td>1.30</td>
<td>-0.06</td>
<td>0.00</td>
</tr>
<tr>
<td>Chickens are the most ethical animal to eat</td>
<td>Consumption</td>
<td>0.07</td>
<td>1.23</td>
<td>0.04</td>
<td>0.00</td>
</tr>
<tr>
<td>Chickens carry diseases like salmonella</td>
<td>Other</td>
<td>0.86</td>
<td>1.35</td>
<td>0.05</td>
<td>-0.01</td>
</tr>
<tr>
<td>Chicken is the healthiest animal to eat</td>
<td>Consumption</td>
<td>0.30</td>
<td>1.23</td>
<td>-0.03</td>
<td>0.06</td>
</tr>
<tr>
<td>Chicken is a good source of protein</td>
<td>Consumption</td>
<td>1.86</td>
<td>1.09</td>
<td>-0.02</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Notes: An asterisk (*) indicates a statistically significant correlation.
Beliefs About Fishes and Chickens & Their Relation to Animal-Positive Behaviors in China

January 2022

Authors: Zach Wulderk, Sebastian Quaade, Dr. Jo Anderson, Dr. Courtney Dillard, Dr. Walter Sánchez-Suárez, and Tom Beggs, MA
Background

Animals raised for food generally receive significantly less attention and funding than companion animals (Faunalytics, 2019), and small-bodied animals like chickens and fish are killed in particularly massive numbers. With China’s large population and export market, the slaughter statistics are among the highest in the world, despite lower per-capita consumption: Over ten billion chickens and close to 15 million tonnes of live fish were slaughtered for food in China in 2018 (Faunalytics, 2020). Unfortunately, as in many countries, the welfare of these animals is not well protected by Chinese law. The Animal Husbandry Law of the People’s Republic of China only covers animals classified as livestock and poultry, and contains minimal welfare standards primarily aimed at food safety (World Animal Protection, 2020). Due to the lack of detailed animal welfare standards, China receives a “G” grade for its protection of farmed animals used in farming from World Animal Protection.

A handful of studies have looked at Chinese perceptions and attitudes toward animal welfare, finding that many Chinese individuals are concerned with animal welfare to some extent (You et al., 2014; Su & Martens, 2017). However, to our knowledge there are no studies that examine the relationship between attitudes toward animals and willingness to take action on their behalf. As such, this study builds on the existing literature by documenting in finer detail which beliefs the Chinese public has about small-bodied animals, as well as how these beliefs are related to animal-positive behaviors. Specifically, we examined the relationships between various beliefs and a willingness to reduce consumption of chickens and fishes. Although our U.S. study also examined willingness to sign a petition calling for improved living and slaughter conditions, a petition is unlikely to be used in the Chinese context. As a result, we included a more general measure of support for improved conditions. Answering questions about the relationships between beliefs and these attitudes is a first step toward understanding what drives animal-positive behavior in China. The findings presented in this report may also prove useful to the Chinese animal protection community.

Key Findings

1. Large majorities of people pledged to reduce their consumption of fish or chicken. Over 70% of people committed to reduce their fish or chicken consumption, suggesting that advocates seeking dietary change may have considerable success even with limited messaging highlighting the benefits of such a change.

2. Some pro-animal beliefs are already common, but there is room for raising awareness on other topics. For example, large majorities recognize the importance of air and water quality to chickens and fishes. However most people do not believe big fish farms are gross or that chickens mind being in a barren environment. More commonly held beliefs likely do not require more information and can be invoked as necessary, but
additional advocacy focused on less commonly held beliefs could increase the frequency of pro-animal beliefs among the public.

3. **The beliefs that had the largest correlations with signing a pledge to reduce fish consumption were that fish can bond with humans, that fish are curious, and that fish are loving.** Focusing advocacy efforts on bolstering these fish-related beliefs may be the most effective way to obtain dietary pledges to reduce consumption.

4. **The beliefs that had the largest correlations with signing a pledge to reduce chicken consumption were that chickens can bond with humans and that chickens are more intelligent than people give them credit for.** Those trying to get people to reduce their consumption of chicken may wish to focus on these themes.

5. **Support for improvements to the quality of life for fishes and chickens is nearly unanimous.** Those seeking to improve the conditions of animals have a strong base of support among the public.

**Recommendations**

1. **Try messaging around the top beliefs to see if you can improve your advocacy efforts.** Based on these findings, messaging around personality, emotions, intelligence, and socialness will likely lead to the best results, even outside the context of diet pledges. Slightly different beliefs were also important for each animal. Therefore, we’d suggest focusing on the strongest messages in each group of beliefs, trying them out, and keeping track of their effectiveness in order to get the best results!

2. **Consider asking for a diet pledge.** These findings suggest that the Chinese public is already open to taking consumption reduction pledges. You may see a significant amount of uptake simply by asking if people would consider reducing the amount of animal products they consume.

3. **Explore the results from other countries and check back for more recommendations as our program of research focusing on chickens and fishes continues.** We have also examined these beliefs in other countries, including the U.S., Brazil, Canada, and India. We will also be using experimental research to provide stronger recommendations about how these beliefs can be leveraged to alter behaviors. Although we have provided preliminary recommendations in this report, an experimental comparison of the most common and strongly associated beliefs is needed to see which can be used most effectively. This research will focus on the U.S., but may have implications for future research in China. Stay tuned for more from our line of research into small-bodied animals!
Research Team
This project is a collaboration between researchers at Faunalytics and Mercy For Animals (MFA): namely, Zach Wulderk, Jo Anderson, and Tom Beggs of Faunalytics and Courtney Dillard, Walter Sanchez-Suarez, and Sebastian Quaade of MFA. We are indebted to Meredith Hui, Rashmit Arora, Diogo Fernandes, and Vitor Clemente for their assistance with linguistic and cultural translation, and to Cristina Mendonça, Meredith Hui, and Nikunj Sharma for their invaluable feedback.

We’d like to thank the CEA Animal Welfare Fund, the Culture and Animals Foundation, and an anonymous donor for funding this work, and the Tipping Point Private Foundation for funding the report translations.

Method Overview
This research is a replication of Faunalytics’ 2020 report Beliefs About Fish and Chickens & Their Relation to Animal-Positive Behaviors, which focused on U.S. adults’ beliefs about small-bodied animals. For this project, we explored beliefs held by adults in China. We translated Faunalytics’ previous survey for use with a Mandarin-speaking Chinese audience, and confirmed with experts that the questions were culturally relevant. On the advice of cultural advisors, we added two belief questions that were not part of the U.S. survey: “Fish/Chickens are easy to raise yourself” and “Fish/Chickens are aggressive.” These were added to reflect potential beliefs arising from the more common experience of raising chickens at home in China. We examined 7 categories of beliefs: about emotions, suffering, personality, intelligence, socialness, consuming the animal, and an “other” category. There were several beliefs in each category, meaning the full list consisted of 35 beliefs about fishes and 34 beliefs about chickens.

We surveyed 1,033 Chinese adults and randomly assigned them to either the fish or chicken version of the survey. We then asked them to rate their level of agreement or disagreement with each of the beliefs for their assigned animal. These surveys were written in Simplified Chinese, but results will be presented in English for consistency across reports. The survey instrument can be found in its original language on Open Science Framework.

We examined two key outcome measures in order to understand how much each belief was associated with important behaviors related to the welfare of each animal: willingness to take a “diet pledge” and support for improved quality of life. For the diet pledge outcome, each participant was asked if they would pledge to reduce their consumption of their assigned animal. For example, participants assigned the fish condition were shown a prompt that read, “In recent years, many people have begun to reduce how much fish they eat, a pattern that is expected to continue. Will you pledge to reduce your own fish consumption?” Those who agreed were then asked to specify the amount they would limit themselves to and to provide a digital signature for their commitment.
For the support for improvements outcome, each participant was asked if they support improvements to the quality of life of their assigned animal. For example, participants in the chicken condition were shown a prompt that read, “Do you support improving the quality of life of chickens?” Participants were able to respond with “yes” or “no.” Please note that this question differed from the question used in the surveys administered in other countries as a part of this research. Whereas respondents in Brazil, India, Canada, and the U.S. were asked about their willingness to sign a petition to improve living and slaughter conditions on farms, Chinese respondents were asked about their support more generally due to the unlikelihood of a petition being used in the Chinese political context.

The diet pledge and support questions were presented at the end of the survey, where they saw a prompt reading, “Great, thank you! Before you finish, we have a couple of quick requests for you. You don’t have to agree to either, but please answer each question.” We specified that respondents’ participation incentive did not rely on them committing to the diet pledge or supporting quality of life improvements. The two outcome measures were counterbalanced, meaning that half of the participants saw the diet pledge first and half saw the support question first.

Throughout this report, we use the plural “fishes” rather than “fish” in order to acknowledge that we are discussing a collection of individuals. Exceptions are made for English translations of survey questions, which use the plural “fish” to reflect its usage by the majority of the English-speaking public. The appropriate Simplified Chinese wording was used for the survey when it was administered.

All top-line descriptive statistics were calculated using data weighted to match population values for gender, age, race/ethnicity, and region. However, as the differences between the weighted and unweighted data were not large, inferential statistics were calculated using unweighted data to avoid introducing additional sources of variance. Additional information on participant traits can be found in the Supplementary Materials.
Results

How Many People Took the Pledge and Support Quality of Life Improvements?

Figure 1: Rates of Animal-Positive Behavior

71% of Chinese participants pledged to reduce their consumption of fish and 76% agreed to reduce their consumption of chicken. Among the participants who pledged to reduce their consumption of fish, 8% pledged to never eat fish, 71% pledged to eat it less than once per week, and 20% pledged to eat it only 1-3 times per week. Of chicken pledge-takers, 5% pledged to never eat chicken, 72% pledged to eat it less than once per week, and 19% pledged to eat it only 1-3 times per week.

97% support improvements to the quality of life of fishes and 98% support improvements to the quality of life of chickens. Because it is already nearly unanimous, we have not included specific recommendations related to increasing the amount of support for quality of life improvements. In general, advocates may benefit from focusing their efforts on shifting other beliefs or by leveraging this existing support to improve conditions.

The Most Common Chinese Beliefs about Fishes & Chickens

The following figures show all of the beliefs included in the study and the proportion of people who either agreed or disagreed with each, depending on which value was greater. This can give a sense of how common each of the beliefs are, which can be helpful in deciding which beliefs already exist and can be tapped into, and which beliefs need to be encouraged.
Fishes

Figure 2: Beliefs About Fishes

- Fish is a good source of protein: 85%
- Water quality isn't that important to fish: 83%
- Fish are gross: 80%
- Fish need room to explore and exercise: 79%
- Fish mostly act out of instinct: 77%
- Fish can communicate with each other: 76%
- Fish are contaminated with plastics, heavy metals, and chemicals: 76%
- Fish play: 72%
- Fish are beautiful: 71%
- Fish can feel pain: 71%
- Fish are the healthiest animal to eat: 66%
- Fish don't care about being overcrowded: 65%
- Individual fish don't have unique characteristics: 65%
- Fish can feel stress: 63%
- Fish can feel negative emotions like fear: 63%
- Fish never find it stressful to be picked up or handled: 62%
- Fish can feel positive emotions like pleasure: 61%
- Fish are curious: 60%
- Fish have no personality: 55%
- Fish don't care for their young: 53%
- If fish products are labelled "sustainable," they come from fish with good welfare: 52%
- Fish are loving: 50%
- Fish can bond with humans: 50%
- Fish can learn: 49%
- Fish are more intelligent than people give them credit for: 47%
- Fish have a lower IQ than most animals: 43%
- Fish don't mind being in a barren environment: 43%
- Many of the farms that produce fish have horrible living conditions: 42%
- Most fish people eat are caught wild in the ocean: 40%
- Most farmed fish are raised inhumanely: 39%
- Fish are easy to raise: 39%
- Eating fish doesn't contribute as much to climate change as eating other animals: 38%
- Fish are aggressive: 36%
- Big fish farms are gross: 35%
- Fish are the most ethical animal to eat: 30%

Percent of respondents who agreed (or disagreed) with each of the beliefs.
Chickens

Figure 3: Beliefs About Chickens

- Chicken is a good source of protein: 81%
- Chickens can communicate with each other: 79%
- Chickens are gross: 78%
- Chickens play: 77%
- Chickens can feel pain: 76%
- Chickens need room to explore and exercise: 74%
- Chickens can feel negative emotions like fear: 74%
- Chickens can feel positive emotions like pleasure: 73%
- Air and water quality aren't that important to chickens: 73%
- Chickens don't care for their young: 72%
- Chickens mostly act out of instinct: 71%
- Chickens are curious: 68%
- Chickens can feel stress: 65%
- Chickens never find it stressful to be picked up or handled: 65%
- Chickens are easy to raise: 64%
- Chickens can bond with humans: 62%
- Chickens are beautiful: 58%
- Individual chickens don't have unique characteristics: 58%
- Chickens are aggressive: 57%
- Chicken is the healthiest animal to eat: 57%
- Chickens can learn: 56%
- If chicken products are labelled "organic," they come from chickens with good welfare: 55%
- Chickens carry diseases like salmonella: 54%
- Chickens are more intelligent than people give them credit for: 54%
- Chickens are loving: 53%
- Chickens have no personality: 51%
- Many of the farms that produce chickens have horrible living conditions: 48%
- Most chickens are raised inhumanely: 48%
- Chickens don't care about being over-crowded: 47%
- Chickens don't mind being in a barren environment: 43%
- Eating chickens doesn't contribute as much to climate change as eating other animals: 41%
- Big chicken farms are gross: 41%
- Chickens are the most ethical animal to eat: 40%
- Chickens have a lower IQ than most animals: 36%

Percent of respondents who agreed (or disagreed) with each of the beliefs.
Which Categories of Beliefs Were Most Strongly Associated with Animal-Positive Behaviors?

Each individual belief is presented in the figures in the next section, in groups of conceptually similar beliefs for each animal. The relative importance of each item within a group of beliefs can be seen for both diet pledges and support for improved quality of life. We also discuss the top-performing individual beliefs across the categories related to the diet pledge. In general, average correlations for the beliefs in each category were small (< .20). In general, beliefs about fishes were more strongly correlated with diet pledges than with support for quality of life improvements. Beliefs about chickens, on the other hand, generally had higher correlations with support for quality of life improvements than with diet pledges.

Table 1: Average Correlations With Pro-Animal Behavior (Overall Rankings)

<table>
<thead>
<tr>
<th>Correlation with Taking a Fish Diet Pledge (Strongest to Weakest)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Fish Emotions Beliefs</td>
</tr>
<tr>
<td>2. Fish Personality Beliefs</td>
</tr>
<tr>
<td>3. Fish Social Beliefs</td>
</tr>
<tr>
<td>4. Other Fish Beliefs</td>
</tr>
<tr>
<td>5. Fish Intelligence Beliefs</td>
</tr>
<tr>
<td>6. Fish Suffering Beliefs</td>
</tr>
<tr>
<td>7. Fish Consumption Beliefs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Correlation with Supporting Improved Fish Quality of Life (Strongest to Weakest)</th>
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<tbody>
<tr>
<td>1. Fish Personality Beliefs</td>
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<tr>
<td>2. Fish Suffering Beliefs</td>
</tr>
<tr>
<td>3. Fish Emotions Beliefs</td>
</tr>
<tr>
<td>4. Fish Intelligence Beliefs</td>
</tr>
<tr>
<td>5. Other Fish Beliefs</td>
</tr>
<tr>
<td>6. Fish Social Beliefs</td>
</tr>
<tr>
<td>7. Fish Consumption Beliefs</td>
</tr>
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</table>
Beliefs about Fishes

Belief categories are presented in order of their average correlation with taking the diet pledge.

**Fish Emotions Beliefs**

Beliefs about fish emotions had the highest average correlation with taking the diet pledge ($r = .16$, $SD = .02$) and the third highest for supporting improved quality of life ($r = .05$, $SD = .05$). All three emotional beliefs were associated with taking the diet pledge, led by the belief that fishes can feel positive emotions like pleasure. In other words, those who believe that fishes experience emotions were more likely to take the diet pledge.

Advocates aiming to reduce fish consumption would likely benefit from emphasizing the emotional nature of fishes regardless of whether the emotion is positive or negative. Support for improving fishes’ quality of life was also associated with the belief that fishes can feel positive emotions.
Beliefs related to fishes’ personalities had the second highest average correlation with taking the diet pledge ($r = .15$, $SD = .10$) and the highest with supporting improved quality of life ($r = .06$, $SD = .03$). Beliefs that fishes can bond with humans, are curious, and are loving all had notably strong associations with taking the diet pledge. Advocates may see success in diet pledge uptake if they emphasize the positive characteristics of fish personalities. Support for
improved quality of life was more common among those who believe that fishes are loving and lower among those who believe that individual fishes don’t have unique characteristics.

**Figure 5: Fish Personality Beliefs And Animal-Positive Behaviors**

*Fish Social Beliefs*

Beliefs about the social nature of fishes had the third highest average correlation with taking the diet pledge ($r = .12, SD = .02$) and second lowest with supporting improved quality of life ($r = .04, SD = .03$). People who believe that fishes can communicate with each other were more
likely to take the diet pledge, while those who believe that fishes don’t care for their young were less likely to.

This suggests that people who perceive fishes to have a more social nature may be more willing to reduce their consumption of fish, meaning advocates may find more success by emphasizing this quality. There were no notable associations between social nature and support for improved quality of life.

Figure 6: Fish Social Beliefs And Animal-Positive Behaviors

Note: ‘*’ indicates that the correlation with support for quality of life was significant. ‘**’ indicates that the correlation with diet pledges was significant.
Other Fish Beliefs

“Other” fish beliefs had the fourth highest average correlation with willingness to take the diet pledge ($r = .09$, $SD = .08$) and third lowest with supporting improved quality of life ($r = .04$, $SD = .01$). People who believe that fishes are easy to raise or that fishes are beautiful were more likely to take the diet pledge. There were no notable associations with supporting improved quality of life.

Figure 7: Other Fish Beliefs And Animal-Positive Behaviors
Fish Intelligence Beliefs

Fish intelligence beliefs had the third lowest average correlation with taking the diet pledge \((r = .09, \text{SD} = .09)\) and fourth highest with supporting improved quality of life \((r = .05, \text{SD} = .04)\). The belief that fishes are more intelligent than people give them credit for had the strongest association with taking the diet pledge. Individuals who believe that fishes can learn were also more likely to take the diet pledge and support improved quality of life.

These results suggest that rather than comparing their intelligence to that of other animals, advocates may be more successful when showing or discussing fishes’ ability to learn.

Figure 8: Fish Intelligence Beliefs And Animal-Positive Behaviors

Note: ‘*’ indicates that the correlation with support for quality of life was significant. ‘**’ indicates that the correlation with diet pledges was significant.
Fish Suffering Beliefs

Beliefs related to the suffering of fishes had the second lowest average correlation with taking the diet pledge \( (r = .07, \text{ SD } = .06) \) and second highest with supporting improved quality of life \( (r = .05, \text{ SD } = .02) \). The belief that fishes need room to explore and exercise had the strongest association with taking the diet pledge. People who believe that fishes can feel pain were also more likely to take the pledge. There were no notable associations with supporting improved quality of life.

When discussing fish farms, advocates seeking to reduce the consumption of fish may be more successful if they focus on how the conditions of these facilities result in pain for fishes and limit specific natural activities, such as exercise and exploration.
Figure 9: Fish Suffering Beliefs And Animal-Positive Behaviors

Fish Consumption Beliefs

The category with the lowest average correlation with taking the diet pledge ($r = .07$, $SD = .07$) and supporting improved quality of life ($r = .04$, $SD = .04$) was beliefs about fish consumption. People who believe that fish products labeled “sustainable” come from animals with good welfare were particularly likely to take the diet pledge, while those who believe fishes are the healthiest animal to eat were somewhat less willing to take it.
The comparatively weak correlations between fish consumption beliefs and diet pledges suggests that advocates may find more success by using other categories, such as fish emotions or personalities, in their messaging.

**Figure 10: Fish Consumption Beliefs And Animal-Positive Behavior**

Beliefs about Chickens
Belief categories are presented in order of the size of their average correlation with taking the diet pledge.
**Chicken Personality Beliefs**

Beliefs related to chickens' personalities had the highest average correlation with taking the diet pledge \( (r = .10, \ SD = .07) \) and third highest with supporting improved quality of life \( (r = .10, \ SD = .03) \). People who believe that chickens can bond with humans were particularly likely to take the diet pledge. Beliefs that chickens play and are curious were also associated with taking the diet pledge. Because the associations between chicken personality beliefs and diet pledges are higher than many other categories, advocates seeking to reduce chicken consumption in China should consider including discussions of chicken personalities in their messaging. Beliefs that chickens can bond with humans and play were also associated with higher likelihood of supporting improved quality of life. However, those who believe that individual chickens don’t have unique characteristics were less likely to support improved quality of life.

**Figure 11: Chicken Personality Beliefs And Animal-Positive Behavior**

Note: ‘#’ indicates that the correlation with support for quality of life was significant. ‘*’ indicates that the correlation with diet pledges was significant.
**Chicken Emotions Beliefs**

Beliefs about chickens’ emotions had the second highest average correlation with taking the diet pledge ($r = .08$, $SD = .04$) and highest with supporting improved quality of life ($r = .13$, $SD = .03$). People who believe that chickens can feel stress or that they can feel positive emotions were more likely to take the pledge. The same is true for supporting improved quality of life, which was most strongly correlated with the belief that chickens can feel negative emotions like fear.

**Figure 12: Chicken Emotion Beliefs And Animal-Positive Behavior**

Note: ‘#’ indicates that the correlation with support for quality of life was significant. ‘*’ indicates that the correlation with diet pledges was significant.
**Chicken Intelligence Beliefs**

Beliefs related to the intelligence of chickens had the third highest average correlation with taking the diet pledge \( (r = .07, \ SD = .08) \) and fourth highest with supporting improved quality of life \( (r = .07, \ SD = .05) \). The belief that chickens are more intelligent than people give them credit for had the strongest association with taking the pledge. Individuals were also more likely to take the pledge and support quality of life improvements if they believe chickens can learn. For advocates seeking to reduce chicken consumption, emphasizing the intelligent nature of chickens may lead to more success than highlighting several other types of beliefs would. Advocates may also wish to consider doing so without comparing their intelligence to that of other animals.

**Figure 13: Chicken Intelligence Beliefs And Animal-Positive Behavior**

Note: ‘*’ indicates that the correlation with support for quality of life was significant. ‘**’ indicates that the correlation with diet pledges was significant.
Chicken Social Beliefs

Beliefs about the social nature of chickens had the fourth highest average correlation with taking the diet pledge \((r = .07, \text{SD} = .02)\) and second highest with supporting quality of life improvements \((r = .11, \text{SD} = .03)\). No beliefs were particularly associated with taking the pledge, though individuals who believe chickens can communicate with each other were more likely to support improved quality of life. We suggest that advocates focus on categories of beliefs like chickens’ personalities and emotions rather than their social nature when seeking diet pledges from the Chinese public.

Figure 14: Chicken Social Beliefs And Animal-Positive Behavior

Note: ‘*’ indicates that the correlation with support for quality of life was significant. ‘**’ indicates that the correlation with diet pledges was significant.
**Other Chicken Beliefs**

“Other” beliefs about chickens had the third lowest average correlation with both taking the diet pledge \((r = .07, \ SD = .04)\) and supporting improved quality of life \((r = .06, \ SD = .02)\). In particular, people who believe that chickens are beautiful were more likely to take the diet pledge and to support quality of life improvements. Those who believe that chickens are easy to raise were also more likely to take the diet pledge. One possible explanation for this finding is that individuals who are more familiar with chickens may be more likely to hold this belief and to have a greater appreciation for them.

**Figure 15: Other Chicken Beliefs And Animal-Positive Behavior**

![Figure 15](image)

Note: '*' indicates that the correlation with support for quality of life was significant. '+' indicates that the correlation with diet pledges was significant.
**Chicken Suffering Beliefs**

Chicken suffering beliefs had the second lowest average correlation with taking the diet pledge ($r = .06$, $SD = .04$) and lowest with supporting improved quality of life ($r = .03$, $SD = .03$). Beliefs that chickens need room to explore and exercise or that many chicken farms have horrible conditions were associated with taking the diet pledge. In other words, people who held these beliefs were more likely to take the pledge. People who believe that chickens need room to explore and exercise were also more likely to support improvements to chickens’ quality of life. Advocates may benefit from highlighting these poor conditions and giving concrete examples of the way they may impact a chicken’s natural behavior.

**Figure 16: Chicken Suffering Beliefs And Animal-Positive Behavior**

![Correlation diagram showing the relationship between various chicken suffering beliefs and animal-positive behaviors.](image-url)
**Chicken Consumption Beliefs**

The category with the lowest average correlation with taking the diet pledge was beliefs about consuming chickens ($r = .05$, $SD = .02$). This category had the second lowest average correlation with support for improved quality of life ($r = .04$, $SD = .02$). No beliefs about chicken consumption stood out as particularly associated with taking the pledge or with supporting quality of life improvements. This suggests that advocates looking to reduce the consumption of chicken may be more successful with other appeals, such as those emphasizing chickens’ personalities or their emotions.

**Figure 17: Chicken Consumption Beliefs And Animal-Positive Behavior**

![Graph showing correlations between chicken consumption beliefs and animal-positive behavior.](image)

Note: ‘*’ indicates that the correlation with support for quality of life was significant. ‘**’ indicates that the correlation with diet pledges was significant.
What Role Did Participant Traits Play?
Table 2 shows the rates of each pro-animal behavior for demographic groups that showed significant differences using a chi-square test of independence. Trends within ordinal variables were also identified using simple logistic regressions. These characteristics include age, income, education, and frequency of fish and chicken consumption. More detailed results can be found in the Supplementary Materials.

- Gender: Though support was nearly unanimous across our sample, men were slightly less likely than women or other genders to support improvements to chickens’ quality of life.
- Age: Older participants were less likely to take the fish diet pledge than younger participants.
- Income: Participants with higher incomes were more likely to take the fish diet pledge than those with lower incomes. In general, participants with lower incomes were also less likely to support improvements for both fishes and chickens compared to participants with higher incomes.
- There was no clear relationship between education and pro-animal behaviors.
- Guardians of companion animals were more likely to take both diet pledges.
- Participants who had handled chickens recently were likely to take both diet pledges than individuals who had not handled chickens.
- Recent fish consumption: There was no clear trend between frequency of fish consumption and willingness to take the fish diet pledge.
- Recent chicken consumption: In general, those who ate chicken more frequently were less likely to take the chicken diet pledge than those who ate chicken less frequently.

As a note, people who already abstained entirely from eating fish or chicken were not offered the diet pledge for that animal.

In addition to the characteristics discussed above, we looked for differences based on whether participants had fished recently. There were no significant differences between groups, which means that the overall percentages should be used for all groups to avoid over-interpretation of non-significant differences. As a reminder, 71% of participants took the diet pledge to reduce their consumption of fish and 76% agreed to reduce their consumption of chicken. 97% of participants expressed support for improvements to the quality of life of fish and 98% support improvements to the quality of life of chickens.
Table 2: Percent Who Took the Diet Pledge or Supported Quality of Life Improvements Based on Group Membership

| Notes | An asterisk (*) indicates that there was a statistically significant difference between groups. For details on how these analyses were conducted, see the Supplementary Materials.

Conclusions

This study adds to our body of knowledge regarding public beliefs about chickens and fishes in China and how they relate to animal-positive actions.

Overall, 71% of participants pledged to reduce their consumption of fish, and 76% of participants pledged to reduce their chicken consumption. The majority of pledgers—72% for chickens and 71% for fishes—agreed to reduce their consumption to less than once per week. Still, only 5% of participants who took the chicken pledge and 8% who took the fish pledge agreed to eliminate their consumption entirely. As such, Chinese advocates might consider reducetarian or flexible advocacy approaches to curbing chicken and fish consumption.

We also found nearly unanimous support for quality of life improvements, with 97% support for fishes and 98% for chickens. The ubiquity of participant support for animal welfare improvements suggests that there may be opportunities to leverage widespread pro-animal sentiment.

Which Beliefs Were Most Common?

The relative prevalence of various beliefs, as summarized in Figures 1 and 2, can serve as useful guides for animal advocates when designing advocacy and awareness campaigns. Animal advocates seeking to reduce animal consumption may want to create campaign messaging that appeals to beliefs that are both widely held and strongly correlated with a willingness to reduce one’s chicken or fish consumption. For instance, campaigns that emphasize the playful nature of chickens and fishes, as well as their need to explore and exercise, may have more success at creating dietary change than campaigns that focus on
other messages. Even though these beliefs were among the most widely held in China, many participants did not hold them, indicating that there is still room for further public awareness about such topics.

Beliefs that were less common but still had significant associations with dietary pledges are good candidates for informational campaigns that can lead to further dietary change down the line. For example, around 50% of participants believed that chickens and fishes are capable of learning, and these beliefs were significantly correlated with a willingness to take a diet pledge. Accordingly, advocates may want to incorporate evidence and images that demonstrate the learning capabilities of chickens and fishes.

In general, understanding the prevalence of various beliefs can help advocates target efforts based on where most people currently stand.

Beliefs Most Strongly Associated With Pro-Animal Behavior

Groups of Beliefs

Our calculations of the average correlation of the items in each group of beliefs, as well as the effect sizes displayed in Figures 3-16, can help advocates understand which groups of beliefs are most strongly associated with animal-positive behavior. For both chickens and fishes, beliefs about emotions and personality were more strongly correlated with animal-positive behavior than most other categories of beliefs were. Beliefs about the social nature of fishes also had a notable average correlation with pledge uptake. Conversely, beliefs related to consumption and suffering had the weakest average associations of the different types of beliefs with willingness to take a diet pledge for both animals.

These results suggest that emphasizing the emotions and personality of chickens and fishes in advocacy may yield more dietary pledges. Advocates may also see similar results if they highlight the social nature of fishes. While some beliefs within these groups were among the most commonly held, many were also less frequent. For this reason, advocates are encouraged to look at the prevalence of individual beliefs to determine whether appealing to these beliefs or focusing on raising public awareness is a more suitable approach.

Beliefs related to the consumption of fishes or chickens were uniformly among the least strongly associated with taking either dietary pledge. In other words, advocates should avoid focusing on these beliefs. A notable exception is the belief that fish products labeled “sustainable” come from fishes with good welfare. Future research should explore this association further to see what actionable insights advocates might be able to gain.

Because of the nearly unanimous support for improved conditions for chickens and fishes, advocates working in a Chinese context could be more effective by focusing their efforts on other goals, such as reducing animal consumption.
It is important to note that ranking belief groups according to average correlations has its limitations. The individual beliefs within a group of beliefs are not always associated with behavior in the same way or to the same extent. For any beliefs advocates are considering using, we suggest paying closer attention to the strength and direction of correlation for each individual belief than to the average correlation for the overall group.

**Individual Beliefs**

As discussed above, beliefs about chicken and fish emotions had the strongest average correlations with taking the dietary pledge. The three beliefs with the strongest associations with taking the fish diet pledge were all related to fish personalities: fish can bond with humans, are curious, and are loving. Five out of the six beliefs with the strongest associations with taking the chicken diet pledge were also personality beliefs: chickens can bond with humans, play, are curious, are loving, and—somewhat counterintuitively—are aggressive. The other top belief in terms of correlation strength was that chickens are more intelligent than people give them credit. The belief that fish are more intelligent than they are given credit for was also among the beliefs most strongly associated with taking the fish pledge. Advocates interested in reducing animal consumption might consider using images of chickens or fishes playing with one another, exploring, or caring for their peers as ways of appealing to these beliefs.

Believing that fish can feel positive emotions and that they can feel negative emotions both have notable associations with taking the fish diet pledge. Believing that chickens experience positive emotions is also associated with a higher willingness to take the diet pledge. However, the same is not true of the belief that chickens experience negative emotions, despite the association between believing that chickens can feel stress and taking the diet pledge. In other words, advocates interested in highlighting the rich emotional lives of chickens should focus on their positive emotions, such as pleasure, or the stress that they feel rather than negative emotions more broadly. By contrast, fish advocates may see more willingness to take a diet pledge by emphasizing either positive or negative emotions.

Although the average correlations of beliefs about suffering were not as strongly related to taking the diet pledge as other types of beliefs, a number of individual suffering beliefs had significant correlations with taking the pledge. For example, believing that chickens and fishes need room to explore had one of the strongest associations with taking the dietary pledge, and the belief that fishes can feel pain also had exhibited a significant association with committing to reduce one’s fish consumption. We also note that the belief about chickens and fishes' need for space were also among the most common for both animals, making it a strong candidate to be one of the primary beliefs advocacy campaigns against intensive animal farming in China could appeal to.

The beauty of chickens and fishes also stood out among individual beliefs for their significant correlations with taking the diet pledges. Some research has shown that emotional
reactions—like the feeling someone could get from seeing a particularly beautiful animal—can have an effect on judgments and decision-making (Angie et al., 2011). Contrasting the beauty of chickens and fishes with the harsh realities on industrial farms could be an effective strategy for encouraging pro-animal behavior. For instance, advocates could compare images of wild rainbow trout with those raised on farms or caught in nets.

Participant Characteristics
This study also allowed us to examine differences in willingness to commit to diet pledges or express support for improved quality of life, as summarized in Table 2. These insights can help advocates understand which social groups to target to increase the number of individuals taking animal-positive action.

Because age was associated with a decreased willingness to take the fish diet pledge, advocates seeking to reduce fish consumption may have more success when targeting younger individuals. Participants with higher incomes were more likely to take the fish diet pledge and to express support for improved quality of life for both chickens and fishes. As a result, advocates working in a Chinese context may wish to consider income-related barriers to reduced consumption of animal products.

Participants who live with companion animals were over 20 percentage points more likely to take the chicken diet pledge and over 30 percentage points more likely to take the fish diet pledge compared to those without companion animals.

Participants who frequently eat chicken products were less likely to take the chicken diet pledge, but those who eat fish products frequently were no less likely to take the fish pledge than those who eat them less often. In other words, advocates interested in reducing fish consumption do not need to focus on current eating habits, but those focused on reducing chicken consumption may have more success with people for whom chicken is already only a small part of their diet.

Future Directions
Although this research provides some useful guidelines for chicken and fish welfare advocacy, more research is required to understand whether these beliefs are a cause of animal-positive behaviors, or whether they are merely associated with them. In a continuation of this line of research, we will also be testing interventions that will attempt to use some of the beliefs that appear most important based on this research to understand whether shifting these beliefs can increase animal-positive behaviors. This will take the form of an experiment (randomized controlled trial), where different groups of people are shown an intervention that targets specific beliefs to see if any of them influence animal-positive behaviors.
Supplementary Materials

Method: Additional Details

Participants and Power

Participants were recruited using a panel company called CINT. In keeping with Faunalytics’ Data Quality Assurance Plan, we performed data checks to screen out answers that may be fraudulent or participants who fail attention checks.

Responses that showed poor data quality or the failure of attention-check questions were excluded. After removing participants in the data cleaning process, we had a total of 510 participants in the fish condition and 523 in the chicken condition. Power analyses indicated that a sample size of 497 per animal would allow for the detection of a small-to-medium effect size (rho = .16) with a power of .95 in a point-biserial correlation (critical t = 1.96), so we were well-powered for our goals. For additional details on the measures, power analysis, analysis plan, and more, please see the pre-registration documents on the Open Science Framework.
Table 3: Participants Traits

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<td>1 or more times per day</td>
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Correlational Analyses

Spearman rank-order correlations were used for analyses because the outcome variables were dichotomous and beliefs were rated on a Likert scale. They can be interpreted the same way as standard Pearson correlations. The scores range from -1 to 1, with scores further away from zero indicating a stronger relationship between the variables in question. It is also an indication of effect size.

Participant Traits Analyses

For our analysis of participant traits, all of which were categorical, we used chi-square tests of independence to test for differences across levels of each trait category. For ordinal variables, we used simple logistic regressions to determine trends.

When conducting chi-square tests on tables with cells containing expected values below 5, Monte Carlo simulations were necessarily used to compute p-values.

Table 4: Summarized Chi-Square Results

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<th>p-value</th>
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<th>p-value</th>
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<th>p-value</th>
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<td>34.27</td>
<td>0.00</td>
<td>0.26</td>
<td>0.61</td>
</tr>
<tr>
<td>Went Fishing</td>
<td>0.13</td>
<td>0.72</td>
<td>2.33</td>
<td>0.13</td>
<td>3.89</td>
<td>0.05</td>
<td>2.53</td>
<td>0.11</td>
</tr>
<tr>
<td>Handled Chickens</td>
<td>16.27</td>
<td>0.00</td>
<td>1.94</td>
<td>0.21</td>
<td>14.26</td>
<td>0.00</td>
<td>2.52</td>
<td>0.13</td>
</tr>
<tr>
<td>Fish Consumption</td>
<td>22.07</td>
<td>0.00</td>
<td>1.02</td>
<td>0.93</td>
<td>7.36</td>
<td>0.09</td>
<td>3.29</td>
<td>0.46</td>
</tr>
<tr>
<td>Chicken Consumption</td>
<td>10.58</td>
<td>0.03</td>
<td>3.01</td>
<td>0.48</td>
<td>25.38</td>
<td>0.00</td>
<td>4.94</td>
<td>0.27</td>
</tr>
</tbody>
</table>

Table 5: Summarized Logistic Regression Results

<table>
<thead>
<tr>
<th>IV</th>
<th>Fish Diet Pledge $\beta$</th>
<th>p-value</th>
<th>Fish Quality of Life Support $\beta$</th>
<th>p-value</th>
<th>Chicken Diet Pledge $\beta$</th>
<th>p-value</th>
<th>Chicken Quality of Life Support $\beta$</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-0.03</td>
<td>0.00</td>
<td>0.03</td>
<td>0.26</td>
<td>-0.01</td>
<td>0.08</td>
<td>0.04</td>
<td>0.12</td>
</tr>
<tr>
<td>Income</td>
<td>0.17</td>
<td>0.02</td>
<td>0.54</td>
<td>0.01</td>
<td>0.09</td>
<td>0.24</td>
<td>0.76</td>
<td>0.00</td>
</tr>
<tr>
<td>Education</td>
<td>-0.05</td>
<td>0.74</td>
<td>-0.12</td>
<td>0.79</td>
<td>0.16</td>
<td>0.25</td>
<td>0.22</td>
<td>0.54</td>
</tr>
<tr>
<td>Fish Consumption</td>
<td>-0.22</td>
<td>0.07</td>
<td>0.34</td>
<td>0.37</td>
<td>-0.14</td>
<td>0.29</td>
<td>0.33</td>
<td>0.38</td>
</tr>
<tr>
<td>Chicken Consumption</td>
<td>-0.10</td>
<td>0.48</td>
<td>-0.30</td>
<td>0.44</td>
<td>-0.33</td>
<td>0.01</td>
<td>0.16</td>
<td>0.66</td>
</tr>
</tbody>
</table>

Average Correlation by Group of Beliefs

The average correlation for each group of beliefs are shown in Table 6 for fishes and Table 7 for chickens. These were also provided in text in the body of the report.

To get these numbers, we averaged the absolute value of each of the correlations for the items in a group for each of the outcome variables. Because the number of responses used for each correlation was approximately the same, this “average of averages” approach does not weight any correlation unduly.
As noted in the Results section, beliefs around the emotions and personalities of fishes were the categories most strongly associated with diet pledges. Personality beliefs had the strongest association with support for quality of life improvements, but all of the categories of beliefs were similarly associated with this outcome measure.
For chickens, the personality group of beliefs was most strongly associated with pledges, while the emotion and social groups of beliefs were most strongly associated with support for improvements to quality of life.

Individual Beliefs

Table 8 and Table 9 below contain the correlation results for all individual beliefs. By default, the beliefs with the strongest average association with the two outcome variables are at the top of the table. The “Mean” column contains a zero-centered average of the 7-point Likert scale used for each belief.
Table 8: Individual Fish Beliefs

<table>
<thead>
<tr>
<th>Belief</th>
<th>Conceptual Category</th>
<th>Mean</th>
<th>SD</th>
<th>Pledge Correlation</th>
<th>Support Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish are loving</td>
<td>Personality</td>
<td>0.69</td>
<td>1.32</td>
<td>0.23*</td>
<td>0.10*</td>
</tr>
<tr>
<td>Fish can bond with humans</td>
<td>Personality</td>
<td>0.67</td>
<td>1.41</td>
<td>0.26*</td>
<td>0.07</td>
</tr>
<tr>
<td>Fish can feel positive emotions like pleasure</td>
<td>Emotions</td>
<td>0.99</td>
<td>1.19</td>
<td>0.18*</td>
<td>0.11*</td>
</tr>
<tr>
<td>If fish products are labelled “sustainable,” they come</td>
<td>Consumption</td>
<td>0.78</td>
<td>1.25</td>
<td>0.20*</td>
<td>0.08</td>
</tr>
<tr>
<td>from fish with good welfare</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish are curious</td>
<td>Personality</td>
<td>0.96</td>
<td>1.23</td>
<td>0.24*</td>
<td>0.04</td>
</tr>
<tr>
<td>Fish need room to explore and exercise</td>
<td>Suffering</td>
<td>1.46</td>
<td>1.11</td>
<td>0.18*</td>
<td>0.06</td>
</tr>
<tr>
<td>Fish can feel pain</td>
<td>Suffering</td>
<td>1.19</td>
<td>1.25</td>
<td>0.15*</td>
<td>0.08</td>
</tr>
<tr>
<td>Fish are easy to raise</td>
<td>Other</td>
<td>0.26</td>
<td>1.42</td>
<td>0.17*</td>
<td>0.05</td>
</tr>
<tr>
<td>Fish can learn</td>
<td>Intelligence</td>
<td>0.47</td>
<td>1.40</td>
<td>0.11*</td>
<td>0.11*</td>
</tr>
<tr>
<td>Fish are more intelligent than people give them credit</td>
<td>Intelligence</td>
<td>0.53</td>
<td>1.37</td>
<td>0.20*</td>
<td>0.02</td>
</tr>
<tr>
<td>for</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fish can feel stress</td>
<td>Emotions</td>
<td>0.94</td>
<td>1.27</td>
<td>0.17*</td>
<td>0.05</td>
</tr>
<tr>
<td>Fish play</td>
<td>Personality</td>
<td>1.21</td>
<td>1.20</td>
<td>0.16*</td>
<td>0.05</td>
</tr>
<tr>
<td>Fish can communicate with each other</td>
<td>Social</td>
<td>1.28</td>
<td>1.18</td>
<td>0.14*</td>
<td>0.07</td>
</tr>
<tr>
<td>Fish are beautiful</td>
<td>Other</td>
<td>1.41</td>
<td>1.16</td>
<td>0.15*</td>
<td>0.05</td>
</tr>
<tr>
<td>Fish can feel negative emotions like fear</td>
<td>Emotions</td>
<td>0.86</td>
<td>1.30</td>
<td>0.14*</td>
<td>0.00</td>
</tr>
<tr>
<td>Fish have no personality</td>
<td>Personality</td>
<td>-0.71</td>
<td>1.38</td>
<td>-0.13*</td>
<td>-0.01</td>
</tr>
<tr>
<td>Individual fish don’t have unique characteristics</td>
<td>Personality</td>
<td>-0.92</td>
<td>1.40</td>
<td>-0.05</td>
<td>-0.09*</td>
</tr>
<tr>
<td>Fish don’t care for their young</td>
<td>Social</td>
<td>-0.69</td>
<td>1.53</td>
<td>-0.11*</td>
<td>-0.02</td>
</tr>
<tr>
<td>Water quality isn’t that important to fish</td>
<td>Suffering</td>
<td>-1.79</td>
<td>1.42</td>
<td>-0.04</td>
<td>-0.08</td>
</tr>
<tr>
<td>Eating fish doesn’t contribute as much to climate change as eating other animals</td>
<td>Consumption</td>
<td>-0.11</td>
<td>1.50</td>
<td>-0.02</td>
<td>-0.09</td>
</tr>
<tr>
<td>Fish are the healthiest animal to eat</td>
<td>Consumption</td>
<td>1.13</td>
<td>1.19</td>
<td>-0.09*</td>
<td>-0.01</td>
</tr>
<tr>
<td>Most fish people eat are caught wild in the ocean</td>
<td>Consumption</td>
<td>0.12</td>
<td>1.49</td>
<td>0.06</td>
<td>0.03</td>
</tr>
<tr>
<td>Fish are gross</td>
<td>Other</td>
<td>-1.60</td>
<td>1.40</td>
<td>-0.04</td>
<td>-0.03</td>
</tr>
<tr>
<td>Fish are aggressive</td>
<td>Personality</td>
<td>-0.22</td>
<td>1.32</td>
<td>0.01</td>
<td>-0.07</td>
</tr>
<tr>
<td>Fish is a good source of protein</td>
<td>Consumption</td>
<td>1.70</td>
<td>1.12</td>
<td>-0.04</td>
<td>-0.02</td>
</tr>
<tr>
<td>Fish are contaminated with plastics, heavy metals, and chemicals</td>
<td>Other</td>
<td>1.39</td>
<td>1.24</td>
<td>0.01</td>
<td>0.04</td>
</tr>
<tr>
<td>Fish don’t mind being in a barren environment</td>
<td>Suffering</td>
<td>-0.30</td>
<td>1.58</td>
<td>0.01</td>
<td>-0.05</td>
</tr>
<tr>
<td>Fish mostly act out of instinct</td>
<td>Intelligence</td>
<td>1.27</td>
<td>1.18</td>
<td>0.00</td>
<td>-0.03</td>
</tr>
<tr>
<td>Fish never find it stressful to be picked up or handled</td>
<td>Suffering</td>
<td>-0.79</td>
<td>1.54</td>
<td>0.02</td>
<td>-0.05</td>
</tr>
<tr>
<td>Most farmed fish are raised inhumanely</td>
<td>Suffering</td>
<td>0.25</td>
<td>1.39</td>
<td>0.07</td>
<td>-0.05</td>
</tr>
<tr>
<td>Big fish farms are gross</td>
<td>Suffering</td>
<td>-0.19</td>
<td>1.44</td>
<td>0.06</td>
<td>-0.04</td>
</tr>
<tr>
<td>Fish have a lower IQ than most animals</td>
<td>Intelligence</td>
<td>0.36</td>
<td>1.36</td>
<td>0.04</td>
<td>-0.02</td>
</tr>
<tr>
<td>Fish are the most ethical animal to eat</td>
<td>Consumption</td>
<td>0.13</td>
<td>1.33</td>
<td>0.00</td>
<td>0.01</td>
</tr>
<tr>
<td>Fish don’t care about being over-crowded</td>
<td>Suffering</td>
<td>-0.95</td>
<td>1.55</td>
<td>0.03</td>
<td>-0.03</td>
</tr>
<tr>
<td>Many of the farms that produce fish have horrible living conditions</td>
<td>Suffering</td>
<td>0.29</td>
<td>1.43</td>
<td>0.05</td>
<td>-0.05</td>
</tr>
</tbody>
</table>

Notes. An asterisk (*) indicates a statistically significant correlation.
Table 9: Individual Chicken Beliefs

<table>
<thead>
<tr>
<th>Belief</th>
<th>Conceptual Category</th>
<th>Mean</th>
<th>SD</th>
<th>Pledge Correlation</th>
<th>Support Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chickens can bond with humans</td>
<td>Personality</td>
<td>0.81</td>
<td>1.32</td>
<td>0.19*</td>
<td>0.13*</td>
</tr>
<tr>
<td>Chickens play</td>
<td>Personality</td>
<td>1.15</td>
<td>1.24</td>
<td>0.14*</td>
<td>0.12*</td>
</tr>
<tr>
<td>Chickens are more intelligent than people give them credit for</td>
<td>Intelligence</td>
<td>0.56</td>
<td>1.46</td>
<td>0.17*</td>
<td>0.08</td>
</tr>
<tr>
<td>Chickens are curious</td>
<td>Personality</td>
<td>1.06</td>
<td>1.21</td>
<td>0.12*</td>
<td>0.11*</td>
</tr>
<tr>
<td>Chickens can feel positive emotions like pleasure</td>
<td>Emotions</td>
<td>1.23</td>
<td>1.20</td>
<td>0.10*</td>
<td>0.14*</td>
</tr>
<tr>
<td>Chickens are loving</td>
<td>Personality</td>
<td>0.78</td>
<td>1.26</td>
<td>0.12*</td>
<td>0.11*</td>
</tr>
<tr>
<td>Chickens can communicate with each other</td>
<td>Social</td>
<td>1.33</td>
<td>1.19</td>
<td>0.09</td>
<td>0.13*</td>
</tr>
<tr>
<td>Chickens can learn</td>
<td>Intelligence</td>
<td>0.53</td>
<td>1.49</td>
<td>0.10*</td>
<td>0.12*</td>
</tr>
<tr>
<td>Chickens can feel stress</td>
<td>Emotions</td>
<td>0.98</td>
<td>1.30</td>
<td>0.11*</td>
<td>0.10*</td>
</tr>
<tr>
<td>Chickens need room to explore and exercise</td>
<td>Suffering</td>
<td>1.20</td>
<td>1.28</td>
<td>0.11*</td>
<td>0.10*</td>
</tr>
<tr>
<td>Chickens can feel negative emotions like fear</td>
<td>Emotions</td>
<td>1.17</td>
<td>1.36</td>
<td>0.04</td>
<td>0.15*</td>
</tr>
<tr>
<td>Chickens are beautiful</td>
<td>Other</td>
<td>0.91</td>
<td>1.31</td>
<td>0.09*</td>
<td>0.09*</td>
</tr>
<tr>
<td>Chickens are aggressive</td>
<td>Personality</td>
<td>0.55</td>
<td>1.34</td>
<td>0.12*</td>
<td>0.04</td>
</tr>
<tr>
<td>Chickens are easy to raise</td>
<td>Other</td>
<td>0.94</td>
<td>1.23</td>
<td>0.11*</td>
<td>0.04</td>
</tr>
<tr>
<td>Chickens can feel pain</td>
<td>Suffering</td>
<td>1.35</td>
<td>1.29</td>
<td>0.07</td>
<td>0.08</td>
</tr>
<tr>
<td>Chickens have no personality</td>
<td>Personality</td>
<td>-0.63</td>
<td>1.39</td>
<td>-0.02</td>
<td>-0.10*</td>
</tr>
<tr>
<td>If chicken products are labelled &quot;organic,&quot; they come from chickens with good welfare</td>
<td>Consumption</td>
<td>0.76</td>
<td>1.27</td>
<td>0.06</td>
<td>0.06</td>
</tr>
<tr>
<td>Individual chickens don't have unique characteristics</td>
<td>Personality</td>
<td>-0.78</td>
<td>1.41</td>
<td>0.00</td>
<td>-0.12*</td>
</tr>
<tr>
<td>Many of the farms that produce chickens have horrible living conditions</td>
<td>Suffering</td>
<td>0.33</td>
<td>1.58</td>
<td>0.11*</td>
<td>-0.01</td>
</tr>
<tr>
<td>Eating chickens doesn't contribute as much to climate change as eating other animals</td>
<td>Consumption</td>
<td>0.15</td>
<td>1.48</td>
<td>-0.07</td>
<td>-0.02</td>
</tr>
<tr>
<td>Chickens don't care about being over-crowded</td>
<td>Suffering</td>
<td>-0.39</td>
<td>1.69</td>
<td>0.08</td>
<td>0.00</td>
</tr>
<tr>
<td>Most chickens are raised inhumanly</td>
<td>Suffering</td>
<td>0.31</td>
<td>1.52</td>
<td>0.06</td>
<td>0.02</td>
</tr>
<tr>
<td>Chickens carry diseases like salmonella</td>
<td>Other</td>
<td>0.60</td>
<td>1.22</td>
<td>0.03</td>
<td>0.05</td>
</tr>
<tr>
<td>Air and water quality aren't that important to chickens</td>
<td>Suffering</td>
<td>-1.12</td>
<td>1.58</td>
<td>-0.02</td>
<td>-0.04</td>
</tr>
<tr>
<td>Chickens mostly act out of instinct</td>
<td>Intelligence</td>
<td>1.05</td>
<td>1.18</td>
<td>-0.01</td>
<td>0.07</td>
</tr>
<tr>
<td>Chickens is a good source of protein</td>
<td>Consumption</td>
<td>1.40</td>
<td>1.20</td>
<td>-0.03</td>
<td>0.06</td>
</tr>
<tr>
<td>Chickens are gross</td>
<td>Other</td>
<td>-1.43</td>
<td>1.40</td>
<td>0.04</td>
<td>-0.07</td>
</tr>
<tr>
<td>Chickens never find it stressful to be picked up or handled</td>
<td>Suffering</td>
<td>-0.85</td>
<td>1.65</td>
<td>0.07</td>
<td>-0.05</td>
</tr>
<tr>
<td>Chickens don't care for their young</td>
<td>Social</td>
<td>-1.15</td>
<td>1.48</td>
<td>0.06</td>
<td>-0.08</td>
</tr>
<tr>
<td>Chickens have a lower IQ than most animals</td>
<td>Intelligence</td>
<td>0.11</td>
<td>1.34</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>Chickens are the most ethical animal to eat</td>
<td>Consumption</td>
<td>0.25</td>
<td>1.46</td>
<td>-0.03</td>
<td>0.01</td>
</tr>
<tr>
<td>Chicken is the healthiest animal to eat</td>
<td>Consumption</td>
<td>0.81</td>
<td>1.29</td>
<td>-0.03</td>
<td>0.05</td>
</tr>
<tr>
<td>Chickens don't mind being in a barren environment</td>
<td>Suffering</td>
<td>0.08</td>
<td>1.55</td>
<td>0.00</td>
<td>0.01</td>
</tr>
<tr>
<td>Big chicken farms are gross</td>
<td>Suffering</td>
<td>-0.24</td>
<td>1.56</td>
<td>0.02</td>
<td>0.00</td>
</tr>
</tbody>
</table>
Beliefs About Fishes and Chickens & Their Relation to Animal-Positive Behaviors in India

January 2022

Authors: Zach Wulderk, Sebastian Quaade, Dr. Jo Anderson, Dr. Courtney Dillard, Dr. Walter Sánchez-Suárez, and Tom Beggs, MA
Background

Animals raised for food generally receive significantly less attention and funding than companion animals (Faunalytics, 2019). In India, as in most countries, small-bodied animals like chickens and fish are killed in particularly massive numbers: Over 2.5 billion chickens and over five million tonnes of live fishes were slaughtered in India in 2018 (Faunalytics, 2020). Although the Constitution of India and the Prevention of Cruelty to Animals Act of 1960 contain language that recognizes animals’ ability to suffer and calls for compassion for all creatures, farmed animals are not well protected by the law (World Animal Protection, 2020). For instance, there are no bans on cage systems for egg laying hens, nor are there limits on stocking densities for broiler chickens. For reasons such as these, India receives an “E” grade for its protection of animals used in farming from World Animal Protection.

Despite fishes and chickens constituting a huge proportion of farmed animals, little is known about public attitudes toward these animals in India. This study replicates our study of fish and chicken beliefs in the U.S. to illuminate which beliefs the Indian public has about small-bodied animals, and how these beliefs are related to animal-positive behaviors. Specifically, we examined the relationships between various beliefs and a willingness to reduce consumption of chickens or fishes and to sign a petition calling for improved living and slaughter conditions. Answering these questions is a first step toward understanding beliefs and attitudes that drive pro-animal behavior in India. The findings presented in this report may also prove useful to animal advocates who are seeking to target an Indian audience more effectively.

Key Findings

1. **Over 70% of people took diet pledges and signed welfare petitions.** A large majority of participants were willing to reduce their consumption of chicken and fish, and were also willing to sign petitions calling for welfare improvements. Advocates who are aiming to secure commitments to a more animal-friendly diet may find success even with little belief-specific messaging.

2. **Animal-related beliefs are not strongly correlated with pro-animal actions.** We found very few significant correlations between beliefs and consumption reduction pledges or welfare petition signatures. Advocates may wish to evaluate their own successes to determine which approaches have the greatest impact while also keeping in mind that many people are already willing to take pro-animal actions when asked.

3. **Many pro-animal beliefs are not especially common.** Although some beliefs, such as chickens’ and fishes’ ability to experience pain, were held by large majorities, many beliefs were held by less than two-thirds of the people we surveyed. For example, less than 60% of people believed that chickens and fishes need room to explore and exercise. While some beliefs do not require more information, advocates who are
interested in raising awareness of facts may wish to focus on messages about fish and chicken experiences, personalities, and intelligence.

### Recommendations

1. **Don’t be afraid to ask.** These findings suggest that the Indian public is already open to taking consumption reduction pledges and signing petitions for improved animal welfare. You may see a significant amount of pro-animal behavior simply by asking if people would consider it.

2. **Try stacking your asks.** If you have interest in both outcomes, try asking for one pro-animal action after a person has already agreed to another. This may help increase pro-animal behavior due to something known as “behavior consistency”—people generally want to be consistent in what they do, so following one successful ask with another related ask may increase uptake. Be careful to avoid overloading people with requests, though.

3. **Explore the results from other countries and check back for more recommendations as our program of research focusing on chickens and fishes continues.** We have also examined these beliefs in other countries, including the U.S., Brazil, Canada, and China. Advocates especially interested in exploring the effects of specific beliefs could consider utilizing the strongest cross-country beliefs from these reports. We will also be using experimental research to provide stronger recommendations about how these beliefs can be leveraged to alter behaviors. Although we have provided preliminary recommendations in this report, an experimental comparison of the most common and strongly associated beliefs is needed to see which can be used most effectively. This research will focus on the U.S., but may have implications for future research in India. Stay tuned for more from our line of research into small-bodied animals!

### Research Team

This project is a collaboration between researchers at Faunalytics and Mercy For Animals (MFA): namely, Zach Wulderk, Jo Anderson, and Tom Beggs of Faunalytics and Courtney Dillard, Walter Sanchez-Suarez, and Sebastian Quaade of MFA. We are indebted to Meredith Hui, Rashmit Arora, Diogo Fernandes, and Vitor Clemente for their assistance with linguistic and cultural translation, and to Cristina Mendonça, Meredith Hui, and Nikunj Sharma for their invaluable feedback.

We’d like to thank the CEA Animal Welfare Fund, the Culture and Animals Foundation, and an anonymous donor for funding this work, and the Tipping Point Private Foundation for funding the report translations.
Method Overview

This research is a replication of Faunalytics’ 2020 report Beliefs About Fish and Chickens & Their Relation to Animal-Positive Behaviors, which focused on U.S. adults’ beliefs about small-bodied animals. For this project, we explored beliefs held by adults in India. We examined 7 categories of beliefs: about emotions, suffering, personality, intelligence, socialness, consuming the animal, and an “other” category. There were several beliefs in each category, meaning the full list consisted of 33 beliefs about fishes and 32 beliefs about chickens.

We surveyed Indian adults and, after data cleaning, were left with 881 responses. More information about our data cleaning process can be found in the Supplementary Materials. Participants were randomly assigned to either the fish or chicken version of the survey. We then asked them to rate their level of agreement or disagreement with each of the beliefs for their assigned animal. Because India does not have a single language spoken by the vast majority of the population, researchers always have to decide which language(s) to use in a survey. In consultation with an Indian researcher, we elected to conduct the survey in English, which is spoken by a large proportion of the population, and a more geographically diverse one than Hindi. Some research suggests that the English-speaking segment of the Indian population tends to have a higher level of income and education. Some random error may also exist as a result of varying degrees of English comprehension among participants. All results should be interpreted with this in mind. The survey instrument can be found in its original language on Open Science Framework.

We examined two key outcome measures in order to understand how much each belief was associated with important behaviors related to the welfare of each animal: willingness to take a “diet pledge” and willingness to sign a “welfare petition.” For the diet pledge outcome, each participant was asked if they would pledge to reduce their consumption of their assigned animal. For example, participants assigned the fish condition were shown a prompt that read, “In recent years, many people have begun to reduce how much fish they eat, a pattern that is expected to continue. Will you pledge to reduce your own fish consumption?” Those who agreed were then asked to specify the amount they would limit themselves to and to provide a digital signature for their commitment.

For the petition outcome, each participant was asked if they would sign a petition to improve the welfare of their assigned animal. For example, participants in the chicken condition were shown a prompt that read, “We would like to give you the opportunity to sign a petition that would encourage legal reforms to improve the lives of farmed chickens. Specifically, the petition is designed to build support for regulations that would ensure that chickens raised on farms would have improved living and slaughter conditions. Would you be willing to sign this petition?” Participants were able to respond with “yes please” or “no thanks.”

The diet pledge and petition questions were presented at the end of the survey, where they saw a prompt reading, “Great, thank you! Before you finish, we have a couple of quick requests for you. You don’t have to agree to either, but please answer each question.” We specified that
respondents’ participation incentive did not rely on them committing to the diet pledge or signing the welfare petition. The two outcome measures were counterbalanced, meaning that half of the participants saw the diet pledge first and half saw the welfare petition first.

Throughout this report, we use the plural “fishes” rather than “fish” in order to acknowledge that we are discussing a collection of individuals. Exceptions are made for verbatim references to the survey instruments, which used the plural “fish” because it is more common among the general public.

All top-line descriptive statistics were calculated using data weighted to match population values for gender, age, race/ethnicity, and region. However, as the differences between the weighted and unweighted data were not large, inferential statistics were calculated using unweighted data to avoid introducing additional sources of variance. Additional information on participant traits can be found in the Supplementary Materials.

Results

How Many People Took the Pledge and Signed the Petition?

Figure 1: Rates of Animal-Positive Behavior

72% of Indian participants pledged to reduce their consumption of fish and 76% agreed to reduce their consumption of chicken. 75% of participants agreed to sign the fish welfare petition and 72% agreed to sign the chicken welfare petition.

Among the participants who pledged to reduce their consumption of fish, 18% pledged to never eat fish, 54% pledged to eat it less than once per week, and 20% pledged to eat it only 1-3 times per week. Of chicken pledge-takers, 17% pledged to never eat chicken, 63% pledged to eat it less than once per week, and 15% pledged to eat it only 1-3 times per week.
The Most Common Indian Beliefs about Fishes & Chickens

The following figures show all of the beliefs included in the study and the proportion of people who either agreed or disagreed with each, depending on which value was greater. This can give a sense of how common each of the beliefs are, which can be helpful in deciding which beliefs already exist and can be tapped into, and which beliefs need to be encouraged.

Fishes

Figure 2: Beliefs About Fishes
Which Categories of Beliefs Were Most Strongly Associated with Animal-Positive Behaviors?

Each individual belief is presented in the figures in the next section, in groups of conceptually similar beliefs for each animal. The relative importance of each item within a group of beliefs
can be seen for both diet pledges and petition signatures. We also discuss the top-performing individual beliefs across the categories.

When individual belief correlations were averaged together based on belief category, such as fish suffering or chicken intelligence, the results showed weak relationships ($r \leq .09$) across the board. In other words, no type of belief was clearly preferable when designing the messaging for a campaign, regardless of whether it focuses on fishes or chickens, or whether it seeks diet pledges or petition signatures.

Table 1: Average Correlations With Pro-Animal Behavior (Overall Rankings)

<table>
<thead>
<tr>
<th>Correlation with Taking a Fish Diet Pledge (Strongest to Weakest)</th>
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<tbody>
<tr>
<td>1. Fish Consumption Beliefs</td>
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<tr>
<td>2. Fish Suffering Beliefs</td>
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<td>3. Fish Personality Beliefs</td>
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<td>4. Other Fish Beliefs</td>
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<td>5. Fish Emotions Beliefs</td>
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<td>6. Fish Social Beliefs</td>
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<td>7. Fish Intelligence Beliefs</td>
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<table>
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<tr>
<th>Correlation with Signing a Fish Welfare Petition (Strongest to Weakest)</th>
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<tbody>
<tr>
<td>1. Fish Consumption Beliefs</td>
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<td>2. Fish Personality Beliefs</td>
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<td>3. Fish Suffering Beliefs</td>
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<td>4. Fish Social Beliefs</td>
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<td>5. Other Fish Beliefs</td>
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<tr>
<td>6. Fish Intelligence Beliefs</td>
</tr>
<tr>
<td>7. Fish Emotions Beliefs</td>
</tr>
</tbody>
</table>
Beliefs about Fishes
Belief categories are presented in order of the size of their average correlation with taking the diet pledge. However, as noted above, all correlations were quite small, so attempting to change or work with the public's beliefs about fishes may be less effective than other advocacy strategies not covered in this report.

Fish Consumption Beliefs
Of all belief categories, beliefs about the consumption of fish had the highest average correlation with both taking the diet pledge (r = .07, SD = .05) and signing the welfare petition (r = .05, SD = .02). Individuals who believe that fishes are the healthiest animal to eat or that eating fish doesn't contribute as much to climate change as eating other animals were less likely to take the diet pledge. No notably strong associations stood out for petition signatures.
Figure 4: Fish Consumption Beliefs And Animal-Positive Behaviors

Beliefs related to fish suffering had the second highest average correlation with taking the diet pledge ($r = .06$, $SD = .03$) and the third highest with signing the welfare petition ($r = .04$, $SD = .03$). People who believe that fish can feel pain were more likely to take the diet pledge. No notably strong associations stood out for signing the welfare petition.

Note: * indicates that the correlation with petition signatures was significant. ** indicates that the correlation with diet pledges was significant.

**Fish Suffering Beliefs**

Beliefs related to fish suffering had the second highest average correlation with taking the diet pledge ($r = .06$, $SD = .03$) and the third highest with signing the welfare petition ($r = .04$, $SD = .03$). People who believe that fish can feel pain were more likely to take the diet pledge. No notably strong associations stood out for signing the welfare petition.
Advocates who are aiming to decrease the consumption of fishes in India may benefit from emphasizing the suffering many fishes endure. However, because individual beliefs about fish suffering were not significantly correlated with petition signatures, advocates seeking signatures may find more success by focusing on other belief categories or strategies.

**Figure 5: Fish Suffering Beliefs And Animal-Positive Behaviors**

Note: "*" indicates that the correlation with petition signatures was significant. "**" indicates that the correlation with diet pledges was significant.
**Fish Personality Beliefs**

Fish personality beliefs had the third highest average correlation with taking the diet pledge ($r = .05$, $SD = .04$) and the second highest with signing the welfare petition ($r = .04$, $SD = .03$). The belief that fishes play was associated with taking the diet pledge, suggesting that advocates seeking to reduce fish consumption should consider this line of messaging for their campaigns. No other beliefs about fish personalities were significantly associated with either pro-animal behavior.

**Figure 6: Fish Personality Beliefs And Animal-Positive Behaviors**

Note: * indicates that the correlation with petition signatures was significant. ** indicates that the correlation with diet pledges was significant.
**Other Fish Beliefs**

“Other” beliefs about fishes had the fourth highest average correlation with taking the diet pledge ($r = .05$, SD = .02) and the third lowest with signing the welfare petition ($r = .03$, SD = .03). There were no particularly strong associations between these beliefs and willingness to take the pledge or sign the petition. As a result, advocates may find more success exploring other types of beliefs in their efforts, such as suffering-related beliefs for reducing fish consumption or personality-related beliefs for obtaining petition signatures.

**Figure 7: Other Fish Beliefs And Animal-Positive Behaviors**

![Graph showing correlations between fish beliefs and animal-positive behaviors]

Note: ** indicates that the correlation with petition signatures was significant. *** indicates that the correlation with diet pledges was significant.
**Fish Emotions Beliefs**

Beliefs related to fish emotions had the third lowest average correlation with taking the diet pledge ($r = .05$, $SD = .04$) and the lowest average correlation with signing the welfare petition ($r = .01$, $SD = .01$). None of the individual beliefs stood out as having particularly strong associations with diet pledges or petition signatures. The associations were small, suggesting that it may be difficult to use emotions to influence behavior. Advocates may be able to tailor their approaches more effectively using a different belief category, such as suffering or personality.

**Figure 8: Fish Emotion Beliefs And Animal-Positive Behaviors**
**Fish Social Beliefs**

Beliefs about the social nature of fishes had the second lowest average correlation with taking the diet pledge ($r = .03, \text{SD} = .02$) and the fourth highest with signing the welfare petition ($r = .04, \text{SD} = .03$). Neither belief in this category had notably strong associations with animal-positive actions.

**Figure 9: Fish Social Beliefs And Animal-Positive Behaviors**

Note: "*" indicates that the correlation with petition signatures was significant. "**" indicates that the correlation with diet pledges was significant.
**Fish Intelligence Beliefs**

Fish intelligence beliefs had the lowest average correlation taking the diet pledge ($r = .03$, SD = .01) and second lowest with signing the petition ($r = .02$, SD = .02). There were no notably strong associations between intelligence beliefs and willingness to take the pledge or sign the petition. Instead of highlighting the intelligence of fishes, advocates focusing on an Indian audience may have more success if, for example, fish suffering is emphasized for diet pledges or fish personalities are discussed for petition signatures.

**Figure 10: Fish Intelligence Beliefs And Animal-Positive Behaviors**

Note: """ indicates that the correlation with petition signatures was significant. """" indicates that the correlation with diet pledges was significant.
Beliefs about Chickens
Belief categories are presented in order of the size of their average correlation with taking the diet pledge. Because the correlations were quite small, advocates may find more success using advocacy strategies not covered in this report rather than attempting to change or work with the public's beliefs about chickens.

Chicken Consumption Beliefs
Beliefs related to the consumption of chickens had the highest average correlation with taking the diet pledge ($r = .09$, $SD = .07$) and the second highest with signing the welfare petition ($r = .08$, $SD = .05$). People who believe that eating chickens doesn’t contribute as much to climate change as eating other animals were much less likely to take the diet pledge and were also less likely to sign the welfare petition. Advocates may wish to emphasize the environmental effects of chicken farming in order to counter this belief. Individuals were more likely to sign the welfare petition if they believe that chicken products labeled “organic” came from chickens with good welfare or that chicken is a good source of protein. Why? Those who associate organic practices with welfare may be more likely to value welfare in the first place, leading to more petition signatures.
Beliefs related to the intelligence of chickens had the second highest average correlation with taking the diet pledge ($r = .08$, $SD = .04$), but the second lowest average correlation with signing the welfare petition ($r = .03$, $SD = .02$). Individuals who believe that chickens mostly act out of instinct were less likely to take the diet pledge. There were no particularly strong associations with chicken intelligence beliefs and petition signatures.
Advocates should keep these results in mind when designing their messaging. Even though chicken intelligence beliefs have the strongest association with diet pledges, they do not have nearly as strong an association with petition signatures. As a result, advocates may wish to emphasize that chickens are thinking creatures in order to soften some people’s opposition to reducing their chicken consumption.

Figure 12: Chicken Intelligence Beliefs And Animal-Positive Behaviors

Note: *" indicates that the correlation with petition signatures was significant. **" indicates that the correlation with diet pledges was significant.
**Chicken Personality Beliefs**

Chicken personality beliefs had the third highest average correlation with taking the diet pledge ($r = .07$, $SD = .04$) and fourth highest with signing the welfare petition ($r = .05$, $SD = .02$). In particular, beliefs that chickens can bond with humans and are loving had the strongest associations with taking the diet pledge. None of these beliefs was notably associated with willingness to sign the welfare petition. Advocates who aim to reduce chicken consumption could see benefits from highlighting the strong relationships chickens can form with both humans and other chickens.

**Figure 13: Chicken Personality Beliefs And Animal-Positive Behaviors**
**Other Chicken Beliefs**

“Other” chicken beliefs had the fourth highest average correlation with taking the diet pledge ($r = .07, SD = .04$), but the highest with signing the welfare petition ($r = .08, SD = .07$). Both actions were more likely when an individual believed that chickens are beautiful. As a result, advocates may see more animal-positive behaviors come from a campaign that emphasizes the beauty of chickens.

**Figure 14: Chicken Other Beliefs And Animal-Positive Behaviors**

![Graph showing correlation between chicken beliefs and animal-positive behaviors.](image-url)
**Chicken Emotions Beliefs**

For both taking the diet pledge ($r = .06$, $SD = .02$) and signing the welfare petition ($r = .04$, $SD = .04$), beliefs of chickens’ emotions had the third weakest average correlation. None of these beliefs had a notable association with taking the pledge or signing the petition.

**Figure 15: Chicken Emotion Beliefs And Animal-Positive Behaviors**

Note: ‘*’ indicates that the correlation with petition signatures was significant. ‘**’ indicates that the correlation with diet pledges was significant.
Chicken Suffering Beliefs

As discussed earlier in this report, the strength of the average correlations by type of belief were consistently low. Chicken suffering beliefs had the second lowest average correlation with taking the diet pledge \( (r = .06, \ SD = .04) \), but the third highest correlation with signing the welfare petition \( (r = .05, \ SD = .04) \). None of these beliefs was particularly associated with an increase in willingness to take the diet pledge, but three beliefs were associated with less willingness to take the pledge. Participants who believe that chickens never find it stressful to be handled, that air and water quality aren’t that important to chickens, and that chickens don’t care about being over-crowded were also less likely to take the pledge. Participants were also less likely to sign the welfare petition if they doubt the importance of air and water quality for chickens, but were more likely to provide a signature if they believe that many chicken farms have horrible living conditions.

25% of those surveyed believe that air and water quality aren’t important to chickens, meaning a considerable portion of the sample is less likely to sign the welfare petition. Ensuring that people understand the importance of environmental factors for chickens, such as pollution and stress, may be a critical point for advocates to focus on.
Figure 16: Chicken Suffering Beliefs And Animal-Positive Behaviors

**Chicken Social Beliefs**

Beliefs related to the social nature of chickens had the lowest average correlation with both taking the diet pledge ($r = .02$, $SD = .01$) and signing the welfare petition ($r = .02$, $SD = .02$). Neither of the beliefs in this category were associated with taking the pledge or signing the petition, indicating that advocates focusing on chickens may have more success highlighting other aspects of chickens, such as their beauty or ability to form bonds with humans.
What Role Did Participant Traits Play?

Table 2 shows the rates of each pro-animal behavior for demographic groups that showed significant differences using a chi-square test of independence. Trends within ordinal variables were also identified using simple logistic regressions. These characteristics include age, income, education, and frequency of fish and chicken consumption. More detailed results can be found in the Supplementary Materials.
● Age: Older participants were less likely to take the fish diet pledge than younger participants, but also more likely sign the chicken petition than younger participants.
● Education: Participants with higher levels of education were more likely to sign the chicken petition than those with lower levels of education.
● No clear relationships were found between recent fish consumption and pro-animal behaviors.
● Recent chicken consumption: Participants who consume more chicken were more likely to sign the chicken petition than those who consume less chicken.

As a note, people who already abstained entirely from eating fish or chicken were not offered the diet pledge for that animal.

Overall, differences between demographics only emerged when participants were asked to sign the chicken welfare petition. In other words, there may be more disagreement across different segments of the Indian public when it comes to the well-being of chickens.

In addition to the characteristics discussed above, we looked for differences based on gender, religion, income, region, whether participants were guardians of companion animals, whether they had gone fishing recently, and whether they had handled chickens recently. There were no significant differences or trends between groups, which means that the overall percentages should be used for all groups to avoid over-interpretation of non-significant differences. As a reminder, those percentages were as follows: 72% of participants took the diet pledge to reduce their consumption of fish and 76% agreed to reduce their consumption of chicken. 75% of participants agreed to sign the fish welfare petition, and 72% agreed to sign the chicken welfare petition.
Table 2: Percent Who Took the Diet Pledge or Signed the Petition Based on Group Membership

<table>
<thead>
<tr>
<th></th>
<th>Fish Diet Pledge</th>
<th>Fish Petition Signature</th>
<th>Chicken Diet Pledge</th>
<th>Chicken Petition Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woman or Other</td>
<td>73%</td>
<td>78%</td>
<td>73%</td>
<td>76%</td>
</tr>
<tr>
<td>Man</td>
<td>73%</td>
<td>72%</td>
<td>75%</td>
<td>67%</td>
</tr>
<tr>
<td><strong>Religion</strong></td>
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<tr>
<td>Hinduism</td>
<td>75%</td>
<td>74%</td>
<td>74%</td>
<td>70%</td>
</tr>
<tr>
<td>Islam</td>
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<td>76%</td>
<td>77%</td>
<td>76%</td>
</tr>
<tr>
<td>Christianity</td>
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<td>73%</td>
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<td>67%</td>
</tr>
<tr>
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<td>84%</td>
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<td><strong>Region</strong></td>
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</tr>
<tr>
<td>Northern</td>
<td>78%</td>
<td>80%</td>
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<td>72%</td>
</tr>
<tr>
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<td>68%</td>
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</tr>
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<td>76%</td>
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<td>66%</td>
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<td>74%</td>
<td>76%</td>
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<td>80%</td>
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<td>No</td>
<td>73%</td>
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Notes. An asterisk (*) indicates that there was a statistically significant difference between groups. For details on how these analyses were conducted, see the Supplementary Materials.

Conclusions

A substantial majority of participants were willing to commit to animal-positive behaviors: 75% of participants agreed to sign the fish welfare petition and 72% agreed to sign the chicken welfare petition, while 72% of participants took the pledge to reduce their consumption of fish and 76% took the pledge to reduce their consumption of chicken.

Among those who pledged to reduce their consumption of fish, 18% pledged to never eat fish, 54% pledged to eat it less than once per week, and 20% pledged to eat it only 1-3 times per week. Among those who took the chicken pledge, 17% pledged to never eat chicken, 63% pledged to eat it less than once per week, and 15% pledged to eat it only 1-3 times per week.

Because the correlations between beliefs and pro-animal behaviors were generally quite weak and rates of pro-animal behavior were high, advocates may find that emphasizing certain beliefs is not necessary to obtain diet pledge commitments or welfare petition signatures. Instead,
advocates may find a similar amount of success simply by asking members of the public to take a diet pledge or sign a petition. This could also free up resources to be used in other efforts.

English is also not commonly spoken as a first language in India. Of the more than 128 million English-speakers in India, fewer than 1% spoke it as their first language (Office of the Registrar General & Census Commissioner, India, 2011). Because of this, participants may have had poorer reading comprehension of the survey than if it had been conducted in their first language. Advocates should keep this possibility in mind when interpreting the findings presented in this report. They may also wish to conduct their own organizational impact evaluation by carefully tracking rates of uptake for pledges, petitions, and other forms of advocacy they are conducting. This will allow advocates to identify which approaches have been most successful with their audience and update their strategies accordingly.

Which Beliefs Were Most Common?
Animal advocates may wish to consider how to leverage the animal-positive beliefs that are already strongly held on average. Although information on these points may not be required because they are already prevalent, these beliefs may be useful to help drive change.

The relative prevalence of participants' beliefs about chickens and fishes are summarized in Figures 1 and 2. A large proportion of Indian participants hold a number of positive beliefs about chickens and fishes. The most commonly held belief about chickens, at 91%, was that chickens can feel pain. Participants also largely agreed that chickens can communicate with each other and can feel negative emotions like fear. At 94%, the beauty of fishes had the most agreement among participants. Other common beliefs about fishes include that they are loving, can feel pain, and can communicate with each other. Showing descriptions, images, or videos of a fish in pain before asking for diet pledges may be an effective approach for advocates to follow. This is especially true because in addition to being common, this belief was associated with diet reduction pledges. The belief that fish can play, which was held by 79% of participants, was also associated with higher rates of pledging.

However, just because a belief is common doesn’t mean that everyone holds it. For example, some people may still need additional information on why air and water quality are important to chickens. Advocates may also wish to increase the prevalence of beliefs that are less common, like that chickens care about being overcrowded or that fishes need room to explore and exercise.

Beliefs Most Strongly Associated With Pro-Animal Behavior
Although most individual beliefs were not significantly correlated with pro-animal actions, we found several notable associations. Because significant correlations were both infrequent and generally weak, advocates should supplement the information provided in this report with a careful evaluation of the impact of their own advocacy work.
Rates of uptake for the chicken diet pledge and the chicken welfare petition were higher among participants who believed that chickens are beautiful. However, these rates were also lower among those who believed that eating chickens doesn’t contribute as much to climate change as eating other animals, or that air and water quality aren’t that important to chickens. Advocates may be able to increase rates of both chicken diet pledges and petition signatures by, for example, showing images of an especially colorful chicken when making their asks. Alternatively, advocates could aim to reduce hesitancy to take a pledge or sign a petition by discussing the environmental implications of animal agriculture or explain the health effects of poor air and water quality on chickens.

Participants who believed that chickens can bond with humans or are loving were more likely to take the chicken diet pledge than those who didn’t hold these beliefs. Participants who were skeptical about chickens feeling stress when handled or caring about overcrowdedness were less likely to take the chicken diet pledge than those who were less skeptical. Participants who believe that chickens mostly act out of instinct were also less likely to take the pledge. Advocates seeking to reduce chicken consumption could consider approaches that contrast the harsh conditions of big chicken farms with the relationships chickens are able to form in more humane conditions. Welfare petition signatures were more common among participants who believe that many chicken farms have horrible living conditions. Discussing or displaying these conditions when asking for signatures may increase advocates’ rate of success.

We found fewer significant correlations with beliefs related to fishes, perhaps suggesting that the public’s beliefs about chickens are more likely to affect their actions than their beliefs about fishes are. No beliefs were associated with fish welfare petition signatures. However, 75% of participants agreed to sign the petition, indicating that advocates may not need to worry about their specific message when asking for signatures. Uptake of the fish diet pledge was more common among participants who held the belief that fish can feel pain or that they engage in play. Highlighting these characteristics may result in more willingness to reduce fish consumption. By contrast, those who believe that fishes are the healthiest animal to eat or that fish consumption contributes less to climate change than the consumption of other animals were less likely to reduce the amount of fish they eat. Advocates may wish to make use of the belief that fish are contaminated with plastics, heavy metals, and chemicals, which was held by over 60% of participants, in their efforts to reduce fish consumption.

**Participant Characteristics**
This study also allowed us to examine differences in willingness to sign welfare petitions and commit to diet pledges across participant characteristics, as summarized in Table 2. These insights can help advocates understand which social groups to target to increase the number of individuals taking animal-positive action.
With regards to age, older participants were less likely to commit to the fish pledge than younger participants. However, they were also more likely to sign the chicken diet petition than younger participants. Advocates might consider focusing on younger populations when seeking fish consumption reductions, and older populations when advocating for improvements in chickens’ living and slaughter conditions.

Participants with higher levels of education were more likely to sign the chicken petition than those with lower levels of education. However, we do not find any significant differences in pro-animal behavior adoption across income groups. While advocates might consider targeting populations with more education for chicken welfare petitions, this strategy should still consider individuals of differing income levels.

Although frequency of fish product consumption was not associated with differences in pro-animal behaviors, those who consumed chicken more frequently were more likely to sign the chicken welfare petition. This could be an encouraging signal for campaigns for improved chicken welfare, as advocates can show that regular chicken consumers support better conditions for the animals they eat.

Finally, individuals who are companion animal guardians were more likely to take action on behalf of fish, but took action on behalf of chickens at a similar rate to those who were not companion animal guardians. It is possible that those who live intimately with another animal empathize more with fishes, who are discussed less often in conversations about animal welfare than chickens are.

**Future Directions**

While the lack of clear associations between beliefs and pro-animal action may accurately depict the reality in India, it is possible that these results are limited by language comprehension. Further research into Indian attitudes toward chickens and fishes could provide clarity by administering surveys in a number of the languages spoken in India. Animal advocacy organizations operating in India should also consider evaluating the relative success of their own petition and dietary pledge drives, and note which messaging and targeting strategies were associated with the greatest campaign success.

More broadly, additional research is also required to understand whether beliefs correlated with animal-positive behaviors are the cause of those actions or whether they are merely associated with them. In a continuation of our research into beliefs about chickens and fishes, we will be testing interventions that will attempt to use some of the beliefs that appear most important based on this research to understand whether shifting these beliefs can increase animal-positive behaviors. This will take the form of an experiment (randomized controlled trial), where different groups of people in a country with notable correlations are shown an intervention that targets specific beliefs to see if any of them influence animal-positive behaviors.
Supplementary Materials

Method: Additional Details

Participants and Power

Participants were recruited using a panel company called CINT. In keeping with Faunalytics’ Data Quality Assurance Plan, we performed data checks to screen out answers that may be fraudulent or participants who fail attention checks.

Power analyses indicated that a sample size of 497 per animal would allow for the detection of a small-to-medium effect size (rho = .16) with a power of .95 in a point-biserial correlation (critical t = 1.96). We included approximately 250 additional participants for each survey to account for exclusions due to poor data quality or the failure of attention-check questions. Because there is no single language spoken by the vast majority of Indians (discussed in more detail in the Method Overview section), language comprehension may also have played a role in data quality. We removed more participants due to data cleaning than expected, resulting in a total of 453 participants in the fish condition and 428 in the chicken condition. Many responses were excluded for having “suspicious” IP addresses according to the tool we used per our pre-registered plan. Their exclusion had little to no effect on the topline numbers and only minimal differences in the correlational results. A post hoc power analysis yields slightly reduced power of .92 in a point-biserial correlation (critical t = 1.96). For additional details on the measures, power analysis, analysis plan, and more, please see the pre-registration documents on the Open Science Framework.
Table 3: Participants Traits

<table>
<thead>
<tr>
<th>Trait</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gender</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woman or Other</td>
<td>401</td>
<td>46%</td>
</tr>
<tr>
<td>Man</td>
<td>480</td>
<td>54%</td>
</tr>
<tr>
<td><strong>Religion</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hinduism</td>
<td>693</td>
<td>79%</td>
</tr>
<tr>
<td>Islam</td>
<td>78</td>
<td>9%</td>
</tr>
<tr>
<td>Christianity</td>
<td>63</td>
<td>7%</td>
</tr>
<tr>
<td>Other</td>
<td>47</td>
<td>5%</td>
</tr>
<tr>
<td><strong>Age Group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18-24</td>
<td>174</td>
<td>20%</td>
</tr>
<tr>
<td>25-34</td>
<td>283</td>
<td>32%</td>
</tr>
<tr>
<td>35-44</td>
<td>209</td>
<td>24%</td>
</tr>
<tr>
<td>45-54</td>
<td>107</td>
<td>12%</td>
</tr>
<tr>
<td>55-64</td>
<td>77</td>
<td>9%</td>
</tr>
<tr>
<td>65+</td>
<td>31</td>
<td>4%</td>
</tr>
<tr>
<td><strong>Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than ₹7,00</td>
<td>25</td>
<td>3%</td>
</tr>
<tr>
<td>₹7,001 - ₹10,500</td>
<td>20</td>
<td>2%</td>
</tr>
<tr>
<td>₹10,501 - ₹20,000</td>
<td>47</td>
<td>5%</td>
</tr>
<tr>
<td>₹20,001 - ₹50,000</td>
<td>140</td>
<td>16%</td>
</tr>
<tr>
<td>More than ₹50,000</td>
<td>648</td>
<td>74%</td>
</tr>
<tr>
<td>Missing</td>
<td>1</td>
<td>0%</td>
</tr>
<tr>
<td><strong>Education</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 10th</td>
<td>5</td>
<td>1%</td>
</tr>
<tr>
<td>10th pass</td>
<td>13</td>
<td>1%</td>
</tr>
<tr>
<td>12th pass</td>
<td>75</td>
<td>9%</td>
</tr>
<tr>
<td>Technical degree</td>
<td>43</td>
<td>5%</td>
</tr>
<tr>
<td>Bachelor’s degree</td>
<td>430</td>
<td>49%</td>
</tr>
<tr>
<td>Master’s, professional, or doctoral degree</td>
<td>315</td>
<td>36%</td>
</tr>
<tr>
<td><strong>Region</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northern</td>
<td>106</td>
<td>12%</td>
</tr>
<tr>
<td>Central</td>
<td>88</td>
<td>10%</td>
</tr>
<tr>
<td>Eastern</td>
<td>183</td>
<td>21%</td>
</tr>
<tr>
<td>Western</td>
<td>252</td>
<td>29%</td>
</tr>
<tr>
<td>Southern</td>
<td>228</td>
<td>26%</td>
</tr>
<tr>
<td>Northeastern</td>
<td>24</td>
<td>3%</td>
</tr>
<tr>
<td><strong>Companion Animals</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>610</td>
<td>69%</td>
</tr>
<tr>
<td>No</td>
<td>271</td>
<td>31%</td>
</tr>
<tr>
<td><strong>Went Fishing</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>80</td>
<td>9%</td>
</tr>
<tr>
<td>No</td>
<td>801</td>
<td>91%</td>
</tr>
<tr>
<td><strong>Handled Chickens</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>137</td>
<td>16%</td>
</tr>
<tr>
<td>No</td>
<td>744</td>
<td>84%</td>
</tr>
<tr>
<td><strong>Fish Consumption</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>216</td>
<td>25%</td>
</tr>
<tr>
<td>Less than once per week</td>
<td>274</td>
<td>31%</td>
</tr>
<tr>
<td>1-3 times per week</td>
<td>247</td>
<td>28%</td>
</tr>
<tr>
<td>4-6 times per week</td>
<td>106</td>
<td>12%</td>
</tr>
<tr>
<td>1 or more times per day</td>
<td>38</td>
<td>4%</td>
</tr>
<tr>
<td><strong>Chicken Consumption</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>169</td>
<td>19%</td>
</tr>
<tr>
<td>Less than once per week</td>
<td>247</td>
<td>28%</td>
</tr>
<tr>
<td>1-3 times per week</td>
<td>348</td>
<td>40%</td>
</tr>
<tr>
<td>4-6 times per week</td>
<td>96</td>
<td>11%</td>
</tr>
<tr>
<td>1 or more times per day</td>
<td>21</td>
<td>2%</td>
</tr>
</tbody>
</table>
Correlational Analyses

Spearman rank-order correlations were used for analyses because the outcome variables were dichotomous and beliefs were rated on a Likert scale. They can be interpreted the same way as standard Pearson correlations. The scores range from -1 to 1, with scores further away from zero indicating a stronger relationship between the variables in question. It is also an indication of effect size.

Petition Measure

For consistency with the first report in this line of research, the petition outcome variable is measured using agreement to sign the welfare petition rather than whether participants clicked the link to the petition.

Participant Traits Analyses

For our analysis of participant traits, all of which were categorical, we used chi-square tests of independence to test for differences across levels of each trait category. For ordinal variables, we used simple logistic regressions to determine trends.

When conducting chi-square tests on tables with cells containing expected values below 5, Monte Carlo simulations were necessarily used to compute p-values.

Table 4: Summarized Chi-Square Results

<table>
<thead>
<tr>
<th>IV</th>
<th>Fish Diet Pledge</th>
<th>Fish Petition Signature</th>
<th>Chicken Diet Pledge</th>
<th>Chicken Petition Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td>$\chi^2$</td>
<td>p-value</td>
<td>$\chi^2$</td>
<td>p-value</td>
</tr>
<tr>
<td>Religion</td>
<td>3.22</td>
<td>0.36</td>
<td>1.23</td>
<td>0.74</td>
</tr>
<tr>
<td>Age Group</td>
<td>7.12</td>
<td>0.22</td>
<td>4.94</td>
<td>0.44</td>
</tr>
<tr>
<td>Income</td>
<td>0.31</td>
<td>0.99</td>
<td>3.63</td>
<td>0.47</td>
</tr>
<tr>
<td>Education</td>
<td>7.62</td>
<td>0.19</td>
<td>5.00</td>
<td>0.43</td>
</tr>
<tr>
<td>Region</td>
<td>3.85</td>
<td>0.59</td>
<td>7.92</td>
<td>0.16</td>
</tr>
<tr>
<td>Companion Animals</td>
<td>2.95</td>
<td>0.09</td>
<td>0.79</td>
<td>0.37</td>
</tr>
<tr>
<td>Went Fishing</td>
<td>0.00</td>
<td>1.00</td>
<td>0.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Handled Chickens</td>
<td>1.35</td>
<td>0.21</td>
<td>1.59</td>
<td>0.21</td>
</tr>
<tr>
<td>Fish Consumption</td>
<td>3.92</td>
<td>0.42</td>
<td>0.97</td>
<td>0.31</td>
</tr>
<tr>
<td>Chicken Consumption</td>
<td>2.15</td>
<td>0.11</td>
<td>5.29</td>
<td>0.27</td>
</tr>
</tbody>
</table>

Table 5: Summarized Logistic Regression Results

<table>
<thead>
<tr>
<th>IV</th>
<th>Fish Diet Pledge</th>
<th>Fish Petition Signature</th>
<th>Chicken Diet Pledge</th>
<th>Chicken Petition Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>-0.02</td>
<td>0.05</td>
<td>0.01</td>
<td>0.39</td>
</tr>
<tr>
<td>Income</td>
<td>0.01</td>
<td>0.91</td>
<td>0.12</td>
<td>0.25</td>
</tr>
<tr>
<td>Education</td>
<td>0.01</td>
<td>0.93</td>
<td>0.00</td>
<td>0.96</td>
</tr>
<tr>
<td>Fish Consumption</td>
<td>0.19</td>
<td>0.11</td>
<td>0.07</td>
<td>0.48</td>
</tr>
<tr>
<td>Chicken Consumption</td>
<td>0.03</td>
<td>0.84</td>
<td>0.07</td>
<td>0.55</td>
</tr>
</tbody>
</table>
Average Correlation by Group of Beliefs

The average correlation for each group of beliefs are shown in Table 6 for fishes and Table 7 for chickens. These were also provided in text in the body of the report.

To get these numbers, we averaged the absolute value of each of the correlations for the items in a group for each of the outcome variables. Because the number of responses used for each correlation was approximately the same, this “average of averages” approach does not weight any correlation unduly.

Table 6: Average Correlation of Fish Beliefs by Category

<table>
<thead>
<tr>
<th>Belief Category</th>
<th>Correlation Average</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish consumption beliefs and diet pledge</td>
<td>0.07</td>
<td>0.05</td>
</tr>
<tr>
<td>Fish consumption beliefs and petition</td>
<td>0.05</td>
<td>0.02</td>
</tr>
<tr>
<td>Fish suffering beliefs and diet pledge</td>
<td>0.06</td>
<td>0.03</td>
</tr>
<tr>
<td>Fish suffering beliefs and petition</td>
<td>0.04</td>
<td>0.03</td>
</tr>
<tr>
<td>Fish personality beliefs and diet pledge</td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td>Fish personality beliefs and petition</td>
<td>0.04</td>
<td>0.03</td>
</tr>
<tr>
<td>Other fish beliefs and diet pledge</td>
<td>0.05</td>
<td>0.02</td>
</tr>
<tr>
<td>Other fish beliefs and petition</td>
<td>0.03</td>
<td>0.03</td>
</tr>
<tr>
<td>Fish emotions beliefs and diet pledge</td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td>Fish emotions beliefs and petition</td>
<td>0.01</td>
<td>0.01</td>
</tr>
<tr>
<td>Fish social beliefs and diet pledge</td>
<td>0.03</td>
<td>0.02</td>
</tr>
<tr>
<td>Fish social beliefs and petition</td>
<td>0.04</td>
<td>0.03</td>
</tr>
<tr>
<td>Fish intelligence beliefs and diet pledge</td>
<td>0.03</td>
<td>0.01</td>
</tr>
<tr>
<td>Fish intelligence beliefs and petition</td>
<td>0.02</td>
<td>0.02</td>
</tr>
</tbody>
</table>
Table 7: Average Correlation of Chicken Beliefs by Category

<table>
<thead>
<tr>
<th>Belief Category</th>
<th>Correlation Average</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicken consumption beliefs and diet pledge</td>
<td>0.09</td>
<td>0.07</td>
</tr>
<tr>
<td>Chicken consumption beliefs and petition</td>
<td>0.08</td>
<td>0.05</td>
</tr>
<tr>
<td>Chicken intelligence beliefs and diet pledge</td>
<td>0.08</td>
<td>0.04</td>
</tr>
<tr>
<td>Chicken intelligence beliefs and petition</td>
<td>0.03</td>
<td>0.02</td>
</tr>
<tr>
<td>Chicken personality beliefs and diet pledge</td>
<td>0.07</td>
<td>0.04</td>
</tr>
<tr>
<td>Chicken personality beliefs and petition</td>
<td>0.05</td>
<td>0.02</td>
</tr>
<tr>
<td>Other chicken beliefs and diet pledge</td>
<td>0.07</td>
<td>0.04</td>
</tr>
<tr>
<td>Other chicken beliefs and petition</td>
<td>0.08</td>
<td>0.07</td>
</tr>
<tr>
<td>Chicken emotions beliefs and diet pledge</td>
<td>0.06</td>
<td>0.02</td>
</tr>
<tr>
<td>Chicken emotions beliefs and petition</td>
<td>0.04</td>
<td>0.04</td>
</tr>
<tr>
<td>Chicken suffering beliefs and diet pledge</td>
<td>0.06</td>
<td>0.04</td>
</tr>
<tr>
<td>Chicken suffering beliefs and petition</td>
<td>0.05</td>
<td>0.04</td>
</tr>
<tr>
<td>Chicken social beliefs and diet pledge</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>Chicken social beliefs and petition</td>
<td>0.02</td>
<td>0.02</td>
</tr>
</tbody>
</table>

All of the categories had fairly weak average strengths of correlation. As noted in the Results section, beliefs around the consumption of fishes was the category most strongly associated with diet pledges and petition signatures. Beliefs about suffering had the second highest average correlation with taking the diet pledge and beliefs about personality had the second highest with the welfare petition.

For chickens, the consumption group of beliefs was also most strongly associated with pledges, followed by intelligence beliefs. Beliefs in the “Other” category had the highest association with petition signatures, followed by beliefs related to chicken consumption.

**Individual Beliefs**

Table 8 and Table 9 below contain the correlation results for all individual beliefs. By default, the beliefs with the strongest average association with the two outcome variables are at the top of the table. The “Mean” column contains a zero-centered average of the 7-point Likert scale used for each belief.
<table>
<thead>
<tr>
<th>Belief</th>
<th>Conceptual Category</th>
<th>Mean</th>
<th>SD</th>
<th>Pledge Correlation</th>
<th>Petition Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fish are the healthiest animal to eat</td>
<td>Consumption</td>
<td>1.36</td>
<td>1.41</td>
<td>-0.14*</td>
<td>-0.05</td>
</tr>
<tr>
<td>Fish can feel pain</td>
<td>Suffering</td>
<td>1.87</td>
<td>1.23</td>
<td>0.11*</td>
<td>0.08</td>
</tr>
<tr>
<td>Eating fish doesn’t contribute as much to climate change as eating other animals</td>
<td>Consumption</td>
<td>0.19</td>
<td>1.75</td>
<td>-0.11*</td>
<td>-0.06</td>
</tr>
<tr>
<td>Fish like</td>
<td>Personality</td>
<td>1.42</td>
<td>1.46</td>
<td>0.12*</td>
<td>0.02</td>
</tr>
<tr>
<td>Fish don’t mind being in a barren environment</td>
<td>Suffering</td>
<td>-0.32</td>
<td>1.68</td>
<td>-0.08</td>
<td>-0.06</td>
</tr>
<tr>
<td>Fish are loving</td>
<td>Personality</td>
<td>1.84</td>
<td>1.16</td>
<td>0.05</td>
<td>0.08</td>
</tr>
<tr>
<td>Most farmed fish are raised inhumanely</td>
<td>Suffering</td>
<td>0.47</td>
<td>1.48</td>
<td>0.08</td>
<td>0.04</td>
</tr>
<tr>
<td>Fish have no personality</td>
<td>Personality</td>
<td>-0.58</td>
<td>1.67</td>
<td>-0.05</td>
<td>-0.07</td>
</tr>
<tr>
<td>Fish can communicate with each other</td>
<td>Social</td>
<td>1.54</td>
<td>1.33</td>
<td>0.05</td>
<td>0.06</td>
</tr>
<tr>
<td>Many of the farms that produce fish have horrible living conditions</td>
<td>Suffering</td>
<td>0.67</td>
<td>1.50</td>
<td>0.08</td>
<td>0.02</td>
</tr>
<tr>
<td>Fish are contaminated with plastics, heavy metals, and chemicals</td>
<td>Other</td>
<td>0.87</td>
<td>1.86</td>
<td>0.07</td>
<td>0.03</td>
</tr>
<tr>
<td>Fish are beautiful</td>
<td>Other</td>
<td>2.19</td>
<td>1.06</td>
<td>0.03</td>
<td>0.07</td>
</tr>
<tr>
<td>If fish products are labelled “sustainable,” they come from fish with good welfare</td>
<td>Consumption</td>
<td>0.77</td>
<td>1.36</td>
<td>0.02</td>
<td>0.07</td>
</tr>
<tr>
<td>Fish need room to explore and exercise</td>
<td>Suffering</td>
<td>0.32</td>
<td>2.00</td>
<td>0.08</td>
<td>0.01</td>
</tr>
<tr>
<td>Most fish people eat are caught wild in the ocean</td>
<td>Consumption</td>
<td>0.74</td>
<td>1.54</td>
<td>-0.03</td>
<td>-0.06</td>
</tr>
<tr>
<td>Fish are more intelligent than people give them credit for</td>
<td>Intelligence</td>
<td>0.68</td>
<td>1.62</td>
<td>0.03</td>
<td>0.05</td>
</tr>
<tr>
<td>Fish don’t care about being overcrowded</td>
<td>Suffering</td>
<td>-0.12</td>
<td>1.77</td>
<td>-0.03</td>
<td>-0.05</td>
</tr>
<tr>
<td>Fish can feel stress</td>
<td>Emotions</td>
<td>0.89</td>
<td>1.59</td>
<td>0.09</td>
<td>-0.01</td>
</tr>
<tr>
<td>Fish can bond with humans</td>
<td>Personality</td>
<td>0.98</td>
<td>1.53</td>
<td>0.04</td>
<td>0.04</td>
</tr>
<tr>
<td>Water quality isn’t that important to fish</td>
<td>Suffering</td>
<td>-1.40</td>
<td>1.81</td>
<td>0.00</td>
<td>-0.07</td>
</tr>
<tr>
<td>Fish is a good source of protein</td>
<td>Consumption</td>
<td>2.01</td>
<td>1.17</td>
<td>-0.03</td>
<td>-0.04</td>
</tr>
<tr>
<td>Big fish farms are gross</td>
<td>Suffering</td>
<td>0.18</td>
<td>1.56</td>
<td>0.07</td>
<td>0.00</td>
</tr>
<tr>
<td>Fish are the most ethical animal to eat</td>
<td>Consumption</td>
<td>0.73</td>
<td>1.53</td>
<td>-0.09</td>
<td>-0.02</td>
</tr>
<tr>
<td>Fish can feel negative emotions like fear</td>
<td>Emotions</td>
<td>1.47</td>
<td>1.47</td>
<td>0.04</td>
<td>0.02</td>
</tr>
<tr>
<td>Fish are gross</td>
<td>Other</td>
<td>-0.67</td>
<td>1.60</td>
<td>0.05</td>
<td>0.00</td>
</tr>
<tr>
<td>Fish mostly act out of instinct</td>
<td>Intelligence</td>
<td>-0.09</td>
<td>1.62</td>
<td>-0.02</td>
<td>-0.02</td>
</tr>
<tr>
<td>Fish have a lower IQ than most animals</td>
<td>Intelligence</td>
<td>0.01</td>
<td>1.52</td>
<td>0.04</td>
<td>0.00</td>
</tr>
<tr>
<td>Fish don’t care for their young</td>
<td>Social</td>
<td>-0.79</td>
<td>1.75</td>
<td>-0.02</td>
<td>-0.01</td>
</tr>
<tr>
<td>Fish are curious</td>
<td>Personality</td>
<td>1.09</td>
<td>1.36</td>
<td>0.03</td>
<td>0.00</td>
</tr>
<tr>
<td>Fish can learn</td>
<td>Intelligence</td>
<td>1.07</td>
<td>1.56</td>
<td>-0.02</td>
<td>0.00</td>
</tr>
<tr>
<td>Individual fish don’t have unique characteristics</td>
<td>Personality</td>
<td>0.49</td>
<td>1.61</td>
<td>-0.03</td>
<td>0.04</td>
</tr>
<tr>
<td>Fish never find it stressful to be picked up or handled</td>
<td>Suffering</td>
<td>-0.48</td>
<td>1.79</td>
<td>-0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>Fish can feel positive emotions like pleasure</td>
<td>Emotions</td>
<td>1.30</td>
<td>1.36</td>
<td>0.01</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Notes. An asterisk (*) indicates a statistically significant correlation.
### Table 9: Individual Chicken Beliefs

<table>
<thead>
<tr>
<th>Belief</th>
<th>Conceptual Category</th>
<th>Mean</th>
<th>SD</th>
<th>Pledge Correlation</th>
<th>Petition Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eating chickens doesn’t contribute as much to climate change as eating other animals</td>
<td>Consumption</td>
<td>0.41</td>
<td>1.64</td>
<td>-0.20*</td>
<td>-0.10*</td>
</tr>
<tr>
<td>Chickens are beautiful</td>
<td>Other</td>
<td>1.37</td>
<td>1.35</td>
<td>0.11*</td>
<td>0.16*</td>
</tr>
<tr>
<td>Air and water quality aren’t that important to chickens</td>
<td>Suffering</td>
<td>-0.89</td>
<td>1.83</td>
<td>-0.12*</td>
<td>-0.12*</td>
</tr>
<tr>
<td>Chickens never find it stressful to be picked up or handled</td>
<td>Suffering</td>
<td>-0.43</td>
<td>1.70</td>
<td>-0.12*</td>
<td>-0.08</td>
</tr>
<tr>
<td>Chickens can bond with humans</td>
<td>Personality</td>
<td>1.02</td>
<td>1.46</td>
<td>0.13*</td>
<td>0.07</td>
</tr>
<tr>
<td>Chickens are loving</td>
<td>Personality</td>
<td>1.26</td>
<td>1.29</td>
<td>0.10*</td>
<td>0.08</td>
</tr>
<tr>
<td>Chickens can feel positive emotions like pleasure</td>
<td>Emotions</td>
<td>1.12</td>
<td>1.46</td>
<td>0.09</td>
<td>0.09</td>
</tr>
<tr>
<td>Many of the farms that produce chickens have horrible living conditions</td>
<td>Suffering</td>
<td>1.11</td>
<td>1.46</td>
<td>0.07</td>
<td>0.10*</td>
</tr>
<tr>
<td>Chickens mostly act out of instinct</td>
<td>Intelligence</td>
<td>0.24</td>
<td>1.50</td>
<td>-0.11*</td>
<td>-0.06</td>
</tr>
<tr>
<td>Chickens don’t care about being over-crowded</td>
<td>Suffering</td>
<td>0.22</td>
<td>1.63</td>
<td>-0.11*</td>
<td>-0.05</td>
</tr>
<tr>
<td>Chickens carry diseases like salmonella</td>
<td>Other</td>
<td>0.69</td>
<td>1.29</td>
<td>0.07</td>
<td>0.06</td>
</tr>
<tr>
<td>If chicken products are labelled “organic,” they come from chickens with good welfare</td>
<td>Consumption</td>
<td>0.69</td>
<td>1.55</td>
<td>0.00</td>
<td>0.13*</td>
</tr>
<tr>
<td>Chickens need room to explore and exercise</td>
<td>Suffering</td>
<td>0.64</td>
<td>1.70</td>
<td>0.04</td>
<td>0.08</td>
</tr>
<tr>
<td>Chickens are curious</td>
<td>Personality</td>
<td>0.81</td>
<td>1.37</td>
<td>0.08</td>
<td>0.04</td>
</tr>
<tr>
<td>Chickens play</td>
<td>Personality</td>
<td>1.29</td>
<td>1.32</td>
<td>0.06</td>
<td>0.05</td>
</tr>
<tr>
<td>Chickens are more intelligent than people give them credit for</td>
<td>Intelligence</td>
<td>-0.01</td>
<td>1.74</td>
<td>0.08</td>
<td>0.03</td>
</tr>
<tr>
<td>Chickens have no personality</td>
<td>Personality</td>
<td>-0.08</td>
<td>1.63</td>
<td>-0.06</td>
<td>-0.04</td>
</tr>
<tr>
<td>Chickens can feel stress</td>
<td>Emotions</td>
<td>1.02</td>
<td>1.44</td>
<td>0.07</td>
<td>0.02</td>
</tr>
<tr>
<td>Chickens are the most ethical animal to eat</td>
<td>Consumption</td>
<td>0.47</td>
<td>1.63</td>
<td>-0.07</td>
<td>-0.01</td>
</tr>
<tr>
<td>Chickens have a lower IQ than most animals</td>
<td>Intelligence</td>
<td>0.28</td>
<td>1.42</td>
<td>-0.10</td>
<td>0.02</td>
</tr>
<tr>
<td>Chickens can communicate with each other</td>
<td>Social</td>
<td>1.37</td>
<td>1.36</td>
<td>0.03</td>
<td>0.03</td>
</tr>
<tr>
<td>Chickens are gross</td>
<td>Other</td>
<td>0.11</td>
<td>1.55</td>
<td>-0.03</td>
<td>-0.03</td>
</tr>
<tr>
<td>Chickens don’t mind being in a barren environment</td>
<td>Suffering</td>
<td>0.13</td>
<td>1.55</td>
<td>-0.06</td>
<td>0.02</td>
</tr>
<tr>
<td>Big chicken farms are gross</td>
<td>Suffering</td>
<td>0.78</td>
<td>1.53</td>
<td>0.04</td>
<td>0.00</td>
</tr>
<tr>
<td>Individual chickens don’t have unique characteristics</td>
<td>Personality</td>
<td>0.85</td>
<td>1.50</td>
<td>-0.02</td>
<td>-0.01</td>
</tr>
<tr>
<td>Chicken is the healthiest animal to eat</td>
<td>Consumption</td>
<td>0.75</td>
<td>1.58</td>
<td>-0.09</td>
<td>0.05</td>
</tr>
<tr>
<td>Chickens can learn</td>
<td>Intelligence</td>
<td>0.67</td>
<td>1.46</td>
<td>0.02</td>
<td>0.01</td>
</tr>
<tr>
<td>Most chickens are raised inhumanely</td>
<td>Suffering</td>
<td>0.84</td>
<td>1.48</td>
<td>0.00</td>
<td>0.03</td>
</tr>
<tr>
<td>Chickens can feel negative emotions like fear</td>
<td>Emotions</td>
<td>1.50</td>
<td>1.42</td>
<td>0.04</td>
<td>-0.01</td>
</tr>
<tr>
<td>Chicken is a good source of protein</td>
<td>Consumption</td>
<td>1.88</td>
<td>1.21</td>
<td>-0.07</td>
<td>0.39*</td>
</tr>
<tr>
<td>Chickens don’t care for their young</td>
<td>Social</td>
<td>-1.45</td>
<td>1.59</td>
<td>-0.01</td>
<td>0.00</td>
</tr>
<tr>
<td>Chickens can feel pain</td>
<td>Suffering</td>
<td>2.06</td>
<td>1.10</td>
<td>0.01</td>
<td>-0.01</td>
</tr>
</tbody>
</table>

**Notes.** An asterisk (*) indicates a statistically significant correlation.