RETHINK PRIORITIES

Forecasting farmed animal numbers in 2033

Animal Welfare Department

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Key Findings

We produced rough-and-ready forecasts of the number of animals farmed in 2033 with the aim of helping advocates and funders with prioritization decisions. We focus on the most numerous groups of farmed animals: broiler chickens, finfishes, shrimps, and select insect species (black soldier fly larvae and mealworms).

Key findings

- There will be a potential fourfold increase in the number of these animals slaughtered from 2023 to 2033 and a doubling of the number of animals farmed at any time (according to our midpoint estimates)
- Almost 6 trillion farmed animals could be slaughtered in 2033
- Invertebrates drive the majority of this growth
- Invertebrates already comprise 50% of animals alive on farms at any time and this could rise to 75% over the next ten years: Shrimps will continue to be the most numerous group for now, but insects may overtake them in the future
- There are several large uncertainties in our forecasts and specific numbers should be treated with caution

Recommendation

Animal advocates should prepare for both a rapid expansion in the number of farmed animals and for this growth to bring new challenges posed by a shift towards animal groups with different welfare needs and biology. We believe our forecasts point to an urgent need to address critical questions around the sentience and welfare of farmed invertebrates.

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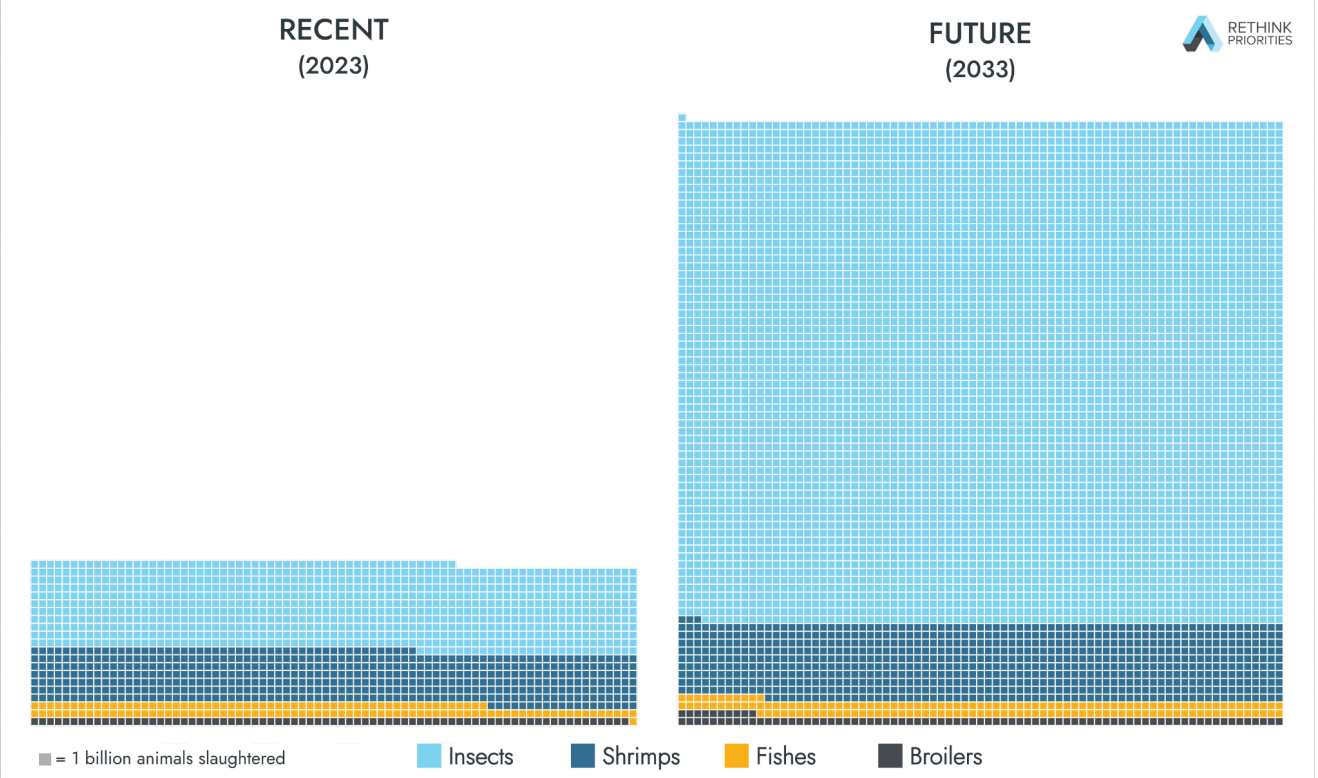
Executive summary

We produced **rough-and-ready forecasts of the number of animals farmed in 2033** with the aim of helping advocates and funders with prioritization decisions. **We focus on the most numerous groups of farmed animals: broiler chickens, finfishes, shrimps, and select insect species.**

Our forecasts suggest **almost 6 trillion of these animals could be slaughtered in 2033** (Figure 1).

Figure 1: Invertebrates could account for 95% of farmed animals slaughtered in 2033 according to our midpoint estimates. Note that 'Insects' only includes black soldier fly larvae and mealworms.



Our midpoint estimates point to a potential **fourfold increase in the number of animals slaughtered from 2023 to 2033** and a **doubling of the number of animals farmed at any time**.

Invertebrates drive the majority of this growth, and could account for 95% of farmed animals slaughtered in 2033 (see Figure 1) and three quarters of those alive at any time in our mid-point projections.

We believe our forecasts point to an **urgent need to address critical questions around the sentience and welfare of farmed invertebrates**.

Our estimates come with **many caveats and warnings**. In particular:

- **Species scope:** For practicality, we produced numbers only for a few key animal groups: broiler chickens, finfishes, shrimp, and certain insects (black soldier flies and mealworms only).

- **Sensitivity to insect farming growth:** Our forecasts are particularly sensitive to the growth in insect farming, which is highly sensitive to the success of insect farming business models and their ability to attract future investment.

The recent and forecasted estimates, with 90% subjective credible intervals, can be viewed below in Table 1.

Table 1: Estimates of recent and forecasted numbers of broiler chickens, finfishes, shrimps, and insects slaughtered and alive at any time, with percentage change in the midpoint estimates.[1]

Group	Slaughtered			Alive at any time		
	Recent	Forecast (2033)	% change (midpoints)	Recent	Forecast (2033)	% change (midpoints)
Broiler chickens	76.2B	87.3B	+14.6%	10.1B	11.6B	+14.6%
Finfishes	133.6B [86.0B; 181.2B]	155.1B [99.8B; 210.4B]	+16.1%	222.6B [180.1B; 265.2B]	258.6B [209.1B; 308.0B]	+16.1%
Shrimps	440.0B [300.0B; 620.0B]	762.7B [520.1B; 1.1T]	+73.4%	230.0B [150.0B; 370.0B]	398.7B [260.0B; 641.4B]	+73.4%
Insects (BSF + mealworms)	472.2B [51.4B; 2.6T]	4.9T [1.8T; 17.3T]	+943.2%	38.2B [3.7B; 254.7B]	417.0B [111.8B; 1.7T]	+991.1%

[1] Recent years: Broiler chickens = 2023; Finfishes = 2022; Shrimps = 2020; Insects = 2022
Forecast year: 2033 for all groups
B = billion; T = trillion
Square brackets show 90% credible intervals

Introduction

Hundreds of billions of animals are raised on farms every year. This number has been steadily increasing since the 1960s (see e.g., Ritchie et al., 2023). However, figures like these have often excluded invertebrates and aquatic animals. When they are included, estimates suggest farmed shrimps currently dominate the picture, with 230 billion alive on farms at any time (Waldhorn & Autric, 2023). With billions of dollars being invested into scaling insect farming (Shah, 2024), the picture could change again. So, **how many animals will be farmed in the future? And what species groups will they belong to?**

We provide rough-and-ready estimates to support advocates and funders in making prioritization decisions. Forward-looking estimates can help tailor present decision-making for future impact, enabling decision-makers to allocate resources to the species groups that may experience the most suffering in aggregate.

We estimate forecasts for four main groups of farmed animals: broiler chickens (the most widely farmed terrestrial vertebrate)[2], finfishes, shrimps, and insects. Within insects, we provide forecasts only for black soldier flies and mealworms, the species that have attracted the most financial investment (Shah, 2024).[3] Our species scope was based on practicality (e.g., data availability, time needed to develop forecasts), scale, and expectations of future growth.

We estimate how many individuals of these four groups will be slaughtered and will be alive at any moment annually out to 2033.

There are multiple challenges in forecasting farmed animal numbers, especially in data availability and uncertainties about the future. We provide more detail in the Caveats section. Due to these considerations and time constraints, this report does not:

- Identify new emerging farmed species (beyond insects)
- Explore geographic trends—we only estimate numbers on a global level
- Evaluate the case for sentience in different species groups
- Analyze the underlying causes of farmed animal industry growth

[2] While we do not estimate and present the results for laying chickens alive at any time here, a very rough calculation suggests that the number in 2033 would be around 9 billion, just below the number of broiler chickens.

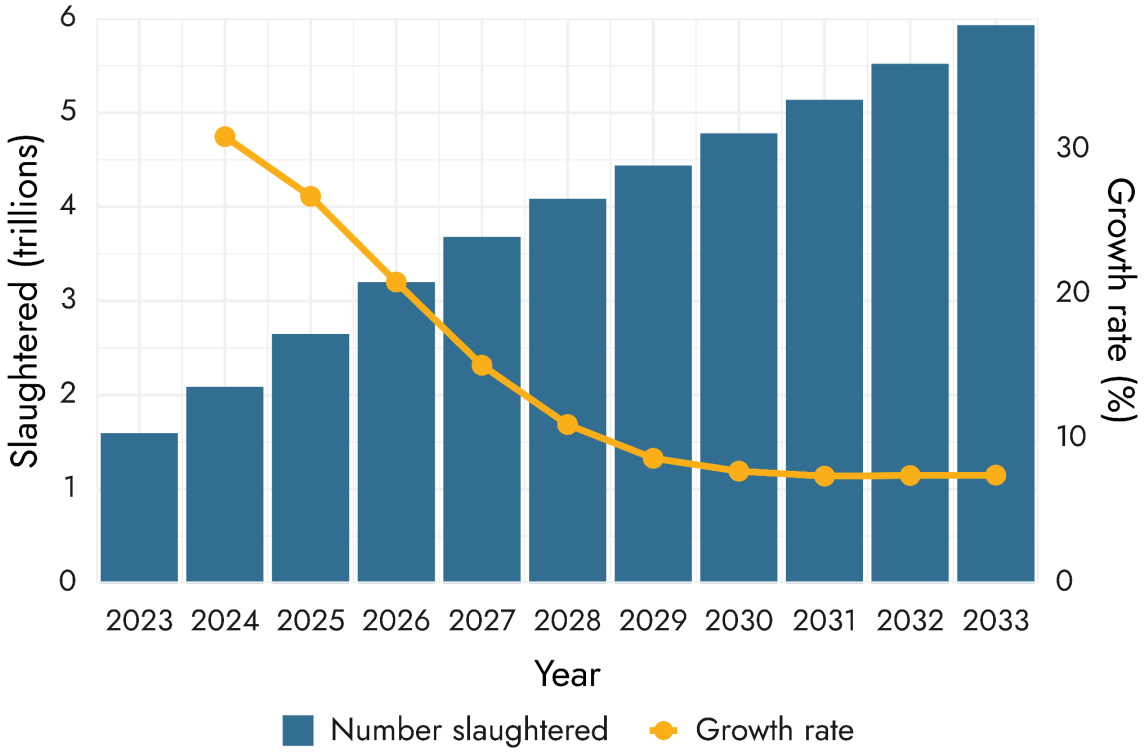
[3] Our farmed insect scope excludes some commercially important farmed insects like crickets, honeybees, and silkworms.

Findings

Animal farming is set to grow over the next decade

Our forecasts suggest that animal agriculture will continue to expand over the next ten years. This expansion translates to roughly 270% more animals slaughtered compared to current levels, according to midpoint estimates. We also found that the pace of growth decreases across the decade (Figure 2).

*Figure 2: Midpoint estimates of the number of farmed animals (broiler chickens, finfishes, shrimps, and insects) **slaughtered yearly** from 2023–2033 (blue bars) and the growth rate in slaughter numbers between years (yellow circles and line).*



The first half of the decade shows the most rapid increase in slaughter numbers across species.[4] This growth is not uniform across species groups, however, with some sectors expanding much faster than others.

Invertebrate farming will drive most growth in the number of farmed animals. While the number of broiler chickens and finfishes show moderate increases of 15% and 16%, respectively, the scale of shrimp farming could grow by 73%. Insect production shows the largest change, with slaughter numbers surging by over 900% (Table 2).

[4] It is important to note that the further into the future an estimate is, the more uncertain it becomes. It is possible that future events we have not accounted for will influence the speed of animal agricultural expansion.

Table 2: Estimates of recent and forecasted numbers of broiler chickens, finfishes, shrimps, and insects slaughtered and alive at any time, with percentage change in the midpoint estimates.[5]

Group	Slaughtered			Alive at any time		
	Recent	Forecast	% change (midpoints)	Recent	Forecast	% change (midpoints)
Broiler chickens	76.2B	87.3B	**+14.6%**	10.1B	11.6B	**+14.6%**
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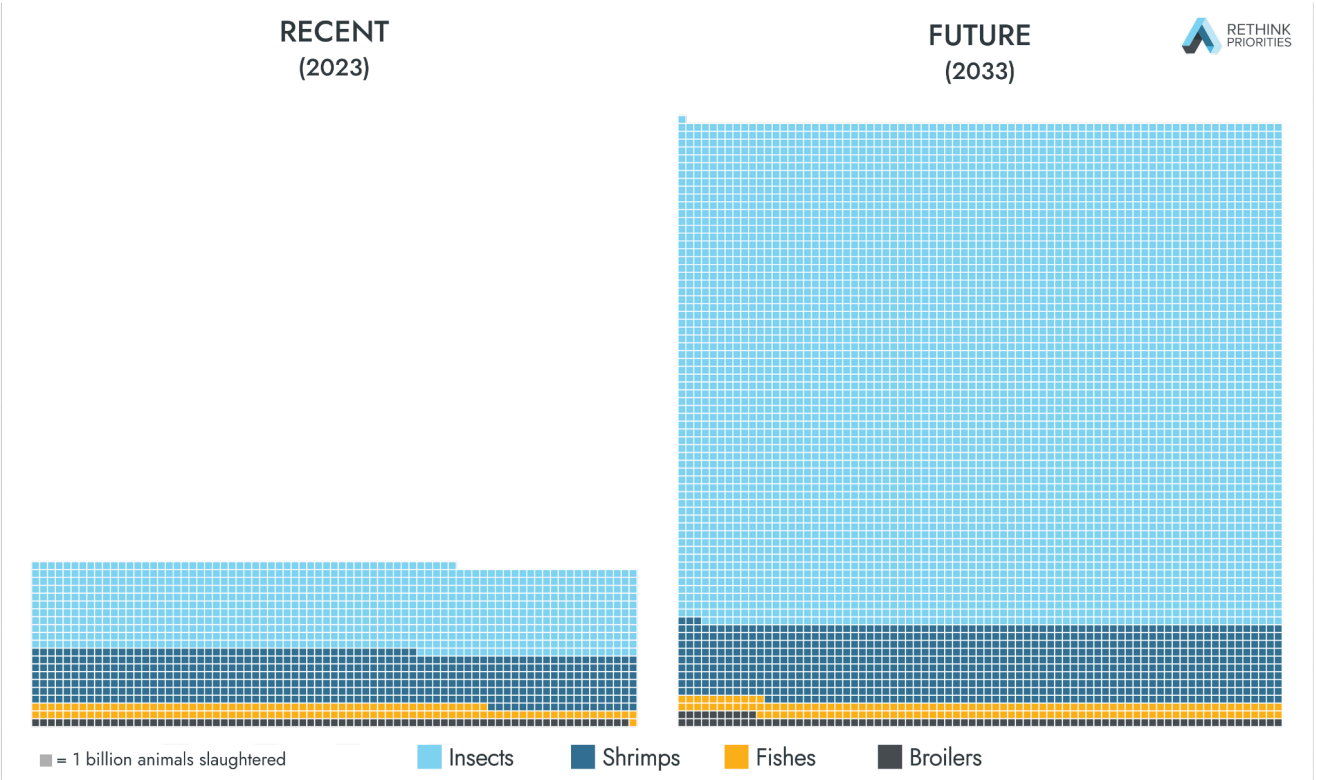
Insects (BSF + mealworms)	472.2B [51.4B; 2.6T]	4.9T [1.8T; 17.3T]	**+943.2%**	38.2B [3.7B; 254.7B]	417.0B [111.8B; 1.7T]	**+991.1%**

[5] Recent years: Broiler chickens = 2023; Finfishes = 2022; Shrimps = 2020; Insects = 2022
Forecast year: 2023 for all groups
B = billion; T = trillion
Square brackets show 90% credible intervals

Almost 6 trillion animals could be slaughtered in 2033

In 2023, around 1.6 trillion animals were slaughtered for food or feed. We project that **by 2033 this number could be 5.9 trillion** (Figure 3). Specifically, this represents an additional 11 billion broiler chickens,[6] 19 billion finfishes (90% subjective credible intervals: 12.3B; 25.8B), 230 billion shrimps (90% SCI: 158.4B; 327.5B), and 4 trillion insects (90% SCI: 1.7T; 13.3T).

*Figure 3: Estimated number of farmed insects, shrimps, finfishes, and broiler chickens **slaughtered** in 2023 and 2033. One square represents 1 billion animals. Numbers shown are our midpoint estimates.*



Meanwhile, the OECD-FAO Agricultural Outlook for the next decade forecasts only minor changes in land used for agriculture and suggests pasture land will decrease in many regions (p. 40). This correlation between rising slaughter numbers and shrinking pasture land implies that **factory farms are more widespread in the future.** Factory farms concentrate more animals per unit area, enabling higher production on less land. These conditions are generally associated with poor welfare.

Beyond an increase in the prevalence of factory farms, this trend could also suggest an escalation in *how* intensive practices are. **The next decade could see both an increase in the number of farmed animals and a worsening of the conditions they experience.**

[6] Our forecasts for broiler chickens lack credible intervals because the FAO data our forecasts were based on do not report uncertainty—see Caveats section for more detail.

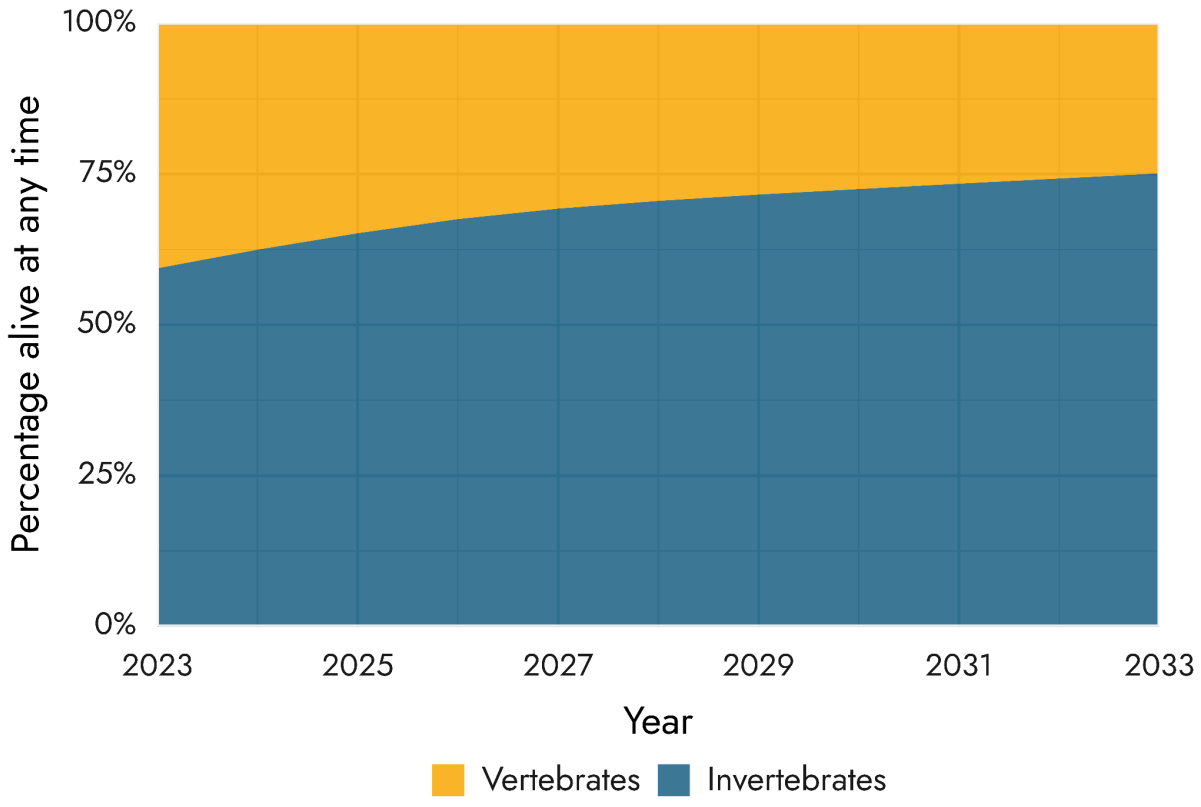
The intensification of practices is echoed in the composition of global farmed animals: up to 95% of animals slaughtered in 2033 (among these four groups) could be invertebrates.[7] **Our estimates suggest a shift towards smaller animals who can be reared at higher densities.**

Today, most farmed animals are invertebrates and this majority will likely increase in the future

While slaughter statistics indicate that invertebrates warrant more attention, it could be argued that the metric alone is insufficient to evaluate the scale of suffering as it overlooks the time spent on farms. However, though insects have shorter lifespans, the scale of invertebrate farming is so large that invertebrates still dominate the number of animals alive at any time.

In 2023, invertebrates comprised over 50% of farmed animals alive at any time across the four major species groups we analyzed. **By 2033, invertebrates could constitute three quarters** (Figure 4).

*Figure 4: Proportion of vertebrates and invertebrates **alive on farms at any moment** from 2023 to 2033. Vertebrates include broiler chickens and finfishes. Invertebrates include shrimps and insects.*[8]

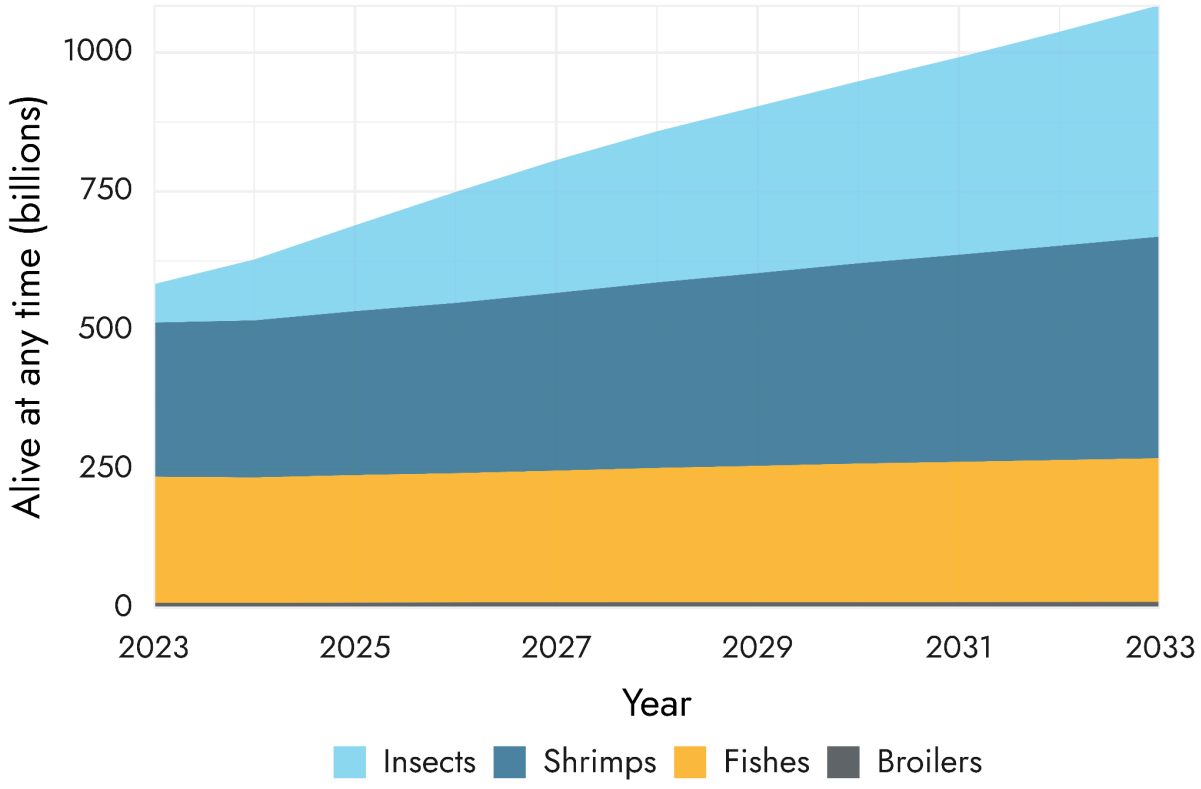


[7] Note the share could be even higher if other commercially important farmed invertebrate species were included (like crickets, silkworms, and honeybees) in scope, although lower if growth in black soldier fly and mealworm farming is slower than implied by our mid-point estimates.

[8] Proportions were calculated using our midpoint estimates.

The predominance of invertebrates is not solely driven by insect farming expansion. **Even excluding insects, invertebrates would remain the majority group due to the vast number of shrimps alive at any moment** (Figure 5).

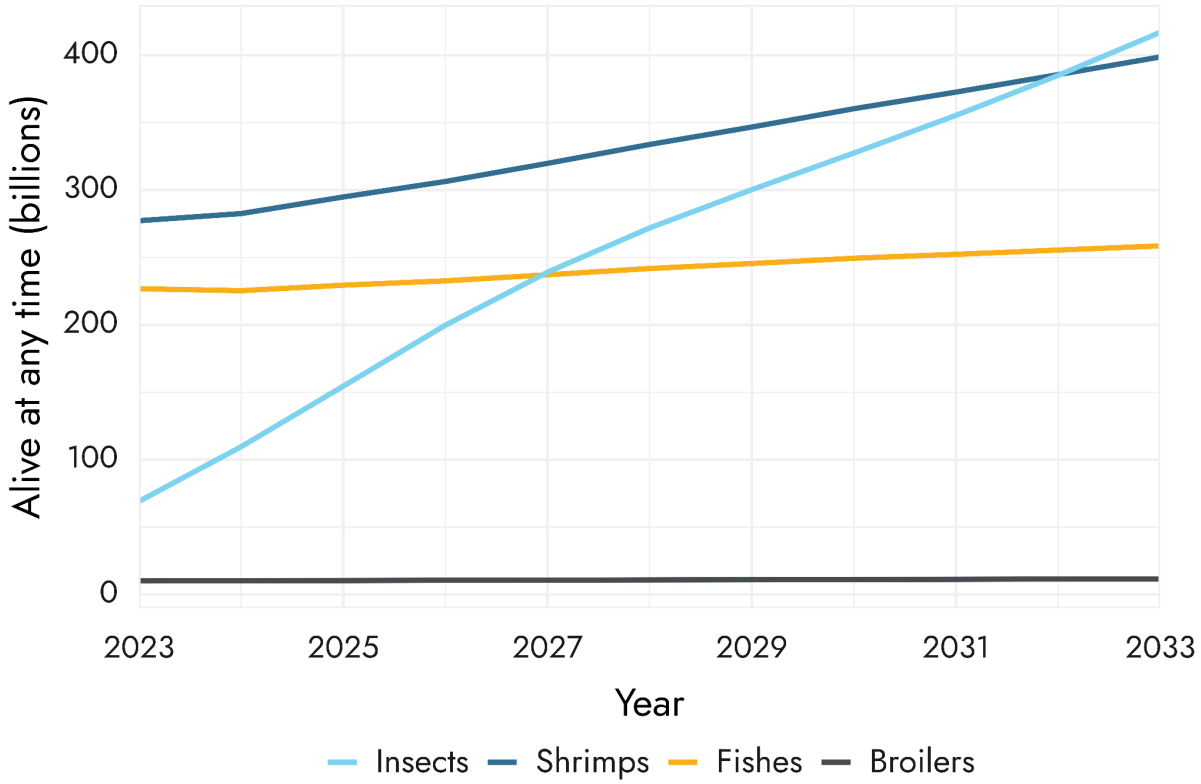
*Figure 5: Midpoint estimates of the number of broiler chickens, finfishes, shrimps, and insects **alive on farms at any given moment** from 2023 to 2033.*



Shrimps, currently the most commonly farmed group (Waldhorn & Autric, 2023), could soon be outnumbered, as over the next decade the insect industry could raise more individuals at any given moment than any other group (Figure 6).[9]

[9] According to our midpoint estimates. When factoring in our uncertainty, credible intervals for insects and shrimps overlap. See Appendix 2 for graphs with credible intervals.

Figure 6: Midpoint estimates of the number of broiler chickens, finfishes, shrimps, and insects alive on farms at any given moment between 2023 and 2033.

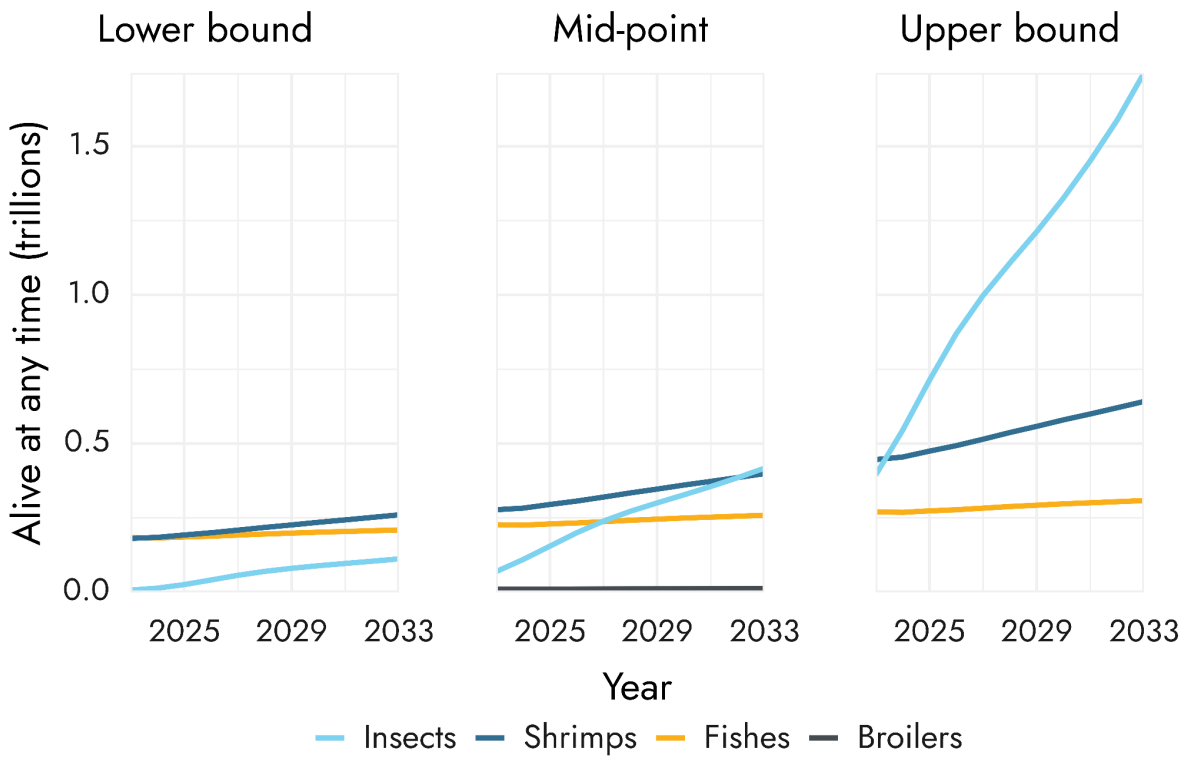


Insect farming could be the fastest-growing animal agriculture industry going forward, but its future is uncertain

The results reported above largely focus on our midpoint estimates. However, these figures hide significant uncertainty about animal agriculture growth in the next decade. In particular, **we are very uncertain about the future of black soldier fly and mealworm farming.**

While our midpoint estimate is that 4.8 trillion insects will be slaughtered in 2033, our 90% credible intervals suggest that this number could range between 1.6 and 17.8 trillion. The number of insects alive at any time could vary from 127 billion to 1.9 trillion, with a midpoint estimate of 476 billion (Figure 7).

Figure 7: Lower bound, midpoint, and upper bound estimates for the number of broiler chickens, finfishes, shrimps, and insects alive on farms at any given moment from 2023 to 2033.[10]



The wide credible intervals are driven by uncertainty around the speed at which the insect farming sector scales up production. Over USD2B has been invested into insect farming businesses since 2014 (Shah, 2024). This is expected to result in significantly increased production. But the degree of growth through to 2033 is likely to depend on the types of business model that are successful. Production will likely be towards the lower end if most insect farming businesses fail to achieve profitability[11], and those that do, operate within a low-scale high-price niche. But production could approach the higher end if firms with lower-cost higher-scale business models are successful.

[10] There are no lower or upper bounds on our broiler chicken estimates (see Method section). Note that 'Insects' includes only black soldier fly larvae and mealworms.

[11] Note that we did not update the Shah (2024) projections to take into account developments at Ynsect and Agronutris since publication. If we were to update the model projections, we would assume slightly lower future investment flows and a higher firm failure rate. Both of these would reduce production of farmed insects, but we do not believe the changes would be big enough to materially change our main take-aways.

Implications for animal advocacy

The scale of farming is set to quantitatively and qualitatively change. Even if individual animal experiences on farms remain similar to current conditions, the rise in animals raised is likely to mean an overall increase in aggregate suffering. The nature of this suffering could also change with the emergence of insect farming, a group whose capacity for suffering we know little about. Animal advocates should therefore prepare for both a rapid expansion in the number of farmed animals and for this growth to bring new challenges posed by a shift towards animal groups with different welfare needs and biology.

Research into invertebrate sentience and welfare is crucial. There is increasing evidence that there is a non-negligible chance that insects and shrimps are sentient (Crump et al., 2022; Gibbons et al., 2022). If they are sentient, some farming practices could be causing significant suffering (McKay & McAuliffe, 2024; Barrett et al., 2023a; Barrett et al., 2023b). However, we currently know very little about the experiences of invertebrates on farms. This currently restricts opportunities to improve conditions for farmed insects and shrimps. Understanding invertebrates' needs is crucial to preventing harm.

The rise of insect farming could expand other animal agriculture sectors. Much of the recent investment into insect farming has been to support using insects as a feed ingredient for pets, aquatic animals and farmed pigs or chickens. While farmed insect producers are currently mainly selling to the pet feed market, rapid growth in insect farming has the potential to support the expansion of other farmed animal sectors.

Caveats

This report describes results from a short "back-of-the-envelope" style approach. Below, we describe the most consequential caveats to our results, but the list is likely non-exhaustive.

A key caveat arising from this approach is that our 90% subjective credible intervals, where provided, do not capture all known sources of uncertainty. Instead, due to time restrictions, they only capture sources of uncertainty that were included in the underlying estimates of recent slaughter and alive at any time numbers. We did not incorporate our uncertainty about any parameters we added beyond those provided by the sources. For example, we did not formally capture uncertainty around the OECD-FAO's growth forecasts for chickens or aquatic animals because bounds were not provided for these estimates, nor did we model uncertainty in metrics we added ourselves, such as the lifespan of animals that die prematurely. A more comprehensive approach would have wider credible intervals for each animal group, and also capture correlations across species (e.g., rapid growth scenarios in insect farming potentially leading to faster growth in aquatic animals).

The results should be interpreted as rough estimations that can inform some aspects of resource prioritization, but should not be used for precise decision making. Barring our uncertainty about there being significant changes in the insect farming sector—as depicted by our wide credible intervals—we are slightly more confident in the rank-order of our results than we are in the specific estimates. This means that, while we are not sure where insects will place, we are more certain that shrimps will outnumber finfishes, who will outnumber broiler chickens. Conversely, the specific estimates we give should be treated with caution for a number of reasons.

Our forecasts for insects do not include some commercially important species such as silkworms, honeybees, and crickets. Exclusion of these species was based on data availability, time, and data analyzed in Shah (2024) suggesting most of the investment (and by extension, growth prospects) into insect farming was for black soldier fly larvae and mealworm production.

Our estimates do not account for potential changes in slaughter weights. For example, it is possible that some demand for meat can be partially met by increasing the amount of meat from each animal, which raises production without the need for more individual animals. Of course, higher slaughter weights present their own welfare concerns, but these are beyond the scope of the present report. It is important to note that changes in intrinsic characteristics of farmed species, including slaughter size but also in other factors like growth, could change the forecasted numbers.

In the fish model, in instances where species were missing data on harvest age and mortality rate, we used the median value of the species with available data. In practice, this meant 92%

of species, which account for 22% of finfish production by volume, had median values for these metrics, rather than species-specific information. The Fishcount data our forecasts are based on use a similar approach for species missing estimated mean weights (around 65% of species). Our estimates for finfishes slaughtered and alive at any time are therefore made significantly uncertain by the limited available species-specific data.

The OECD-FAO Agricultural Outlook for finfishes covers “salmon and trout, shrimp, tilapia, carp, catfish (including Pangasius), seabream and seabass, and molluscs” (p. 243). While the forecasts are applied to FAO tonnage data that should cover most farmed fish species, it is unclear which species are used to estimate growth. Our results are likely sensitive to the breakdown of growth across species, and if commercially important species are missing from growth considerations, the forecasts could be an underestimate.

Acknowledgements



This report is a project of Rethink Priorities—a think-and-do tank dedicated to informing decisions made by high-impact organizations and funders across various cause areas. Hannah McKay did the analysis and wrote the report. Sagar Shah oversaw the project. Thanks to William McAuliffe for feedback, Shaan Shaikh for copy editing, and Urszula Zarosa for assistance with publishing the report online and dissemination.

Appendix 1: Method

Overview

Full calculations are available in this spreadsheet.

Models for broiler chickens, finfishes, and shrimps were calculated by applying the forecasted growth rate in tonnage from the OECD-FAO Agricultural Outlook 2024–2033 to existing estimates of the number of farmed animals slaughtered and alive at any time. Where there was a gap between the most recent estimate for number of individuals and the start year of the OECD-FAO forecast, we calculated the growth rate in tonnage using historical FAO data (FAO, 2025).[12] Forecasted insect slaughter numbers (for black soldier fly larvae and mealworms only) were taken from Shah (2024, unpublished results).[13]

For groups with no recent estimate of number alive at any time, we calculated this using information about harvest age and mortality. These were obtained from various sources for different groups (see Data sources below). For finfishes, when a species was missing harvest age or mortality data, we used the median of the metric from species with data present. This meant 92% of species had average values for these metrics, rather than species-specific information.

We used the following calculation to estimate the number alive at any time:

$$N(lower) = no.\ slaughtered(lower) \times harvest\ age(upper) \times \left(1 + \frac{\left(\frac{1}{survivorship} - 1\right)}{Lifespan\ ratio}\right)$$

$$N(upper) = no.\ slaughtered(upper) \times harvest\ age(lower) \times \left(1 + \frac{\left(\frac{1}{survivorship} - 1\right)}{Lifespan\ ratio}\right)$$

$$N(midpoint) = \frac{N(lower) + N(upper)}{2}$$

The lifespan ratio expresses the ratio between those that reach slaughter age and those that die pre-slaughter. The lifespan ratio was always two, which assumed that animals that die prematurely live half as long as those that make it to slaughter age. For insects, we removed the harvest age term, as this was already accounted for in the historical estimate of the number alive at any time (from Shah, 2024, unpublished results).

[12] For example, the most recent estimate for shrimp slaughtered and alive at any time was Waldhorn and Autric's (2023) estimate for 2020. In this instance, we obtained tonnage data for 2020 to 2023 from FAO and calculated the growth rate between years. The growth rate between years for 2024–2033 was calculated from the OECD-FAO Agricultural Outlook forecasted tonnage.
[13] The unpublished results are available in the calculation spreadsheet.

Data sources

	Calculating growth rate	Calculating future no. slaughtered	Calculating future no. alive at any time			No calculation needed
	Tonnage forecast	Historical no. slaughtered	Historical no. alive at any time	Harvest age	Mortality rate	Forecast slaughter
Broiler chickens	OECD-FAO Agricultural Outlook 2024–2033 for poultry	FAO (2025) data for 2023 **	Calculated from FAO (2025) slaughter data for 2023 **	National Chicken Council	National Chicken Council	—
Finfishes	OECD-FAO Agricultural Outlook 2024–2033 for fish*	Mood & Brooke (2024) data for 2022	Calculated from Mood & Brooke (2024) slaughter data for 2022	Mood & Brooke (2019) data for 2015	Welfare Footprint Institute	—
Shrimps	OECD-FAO Agricultural Outlook 2024–2033 for fish*	Waldhorn & Autric (2023)	Waldhorn & Autric (2023)	Accounted for by Waldhorn & Autric (2023)	Accounted for by Waldhorn & Autric (2023)	—
Insects	—	—	Shah (2024, unpublished results) †	Accounted for by Shah (2024)	Rowe (2020)	Shah (2024, unpublished results) †

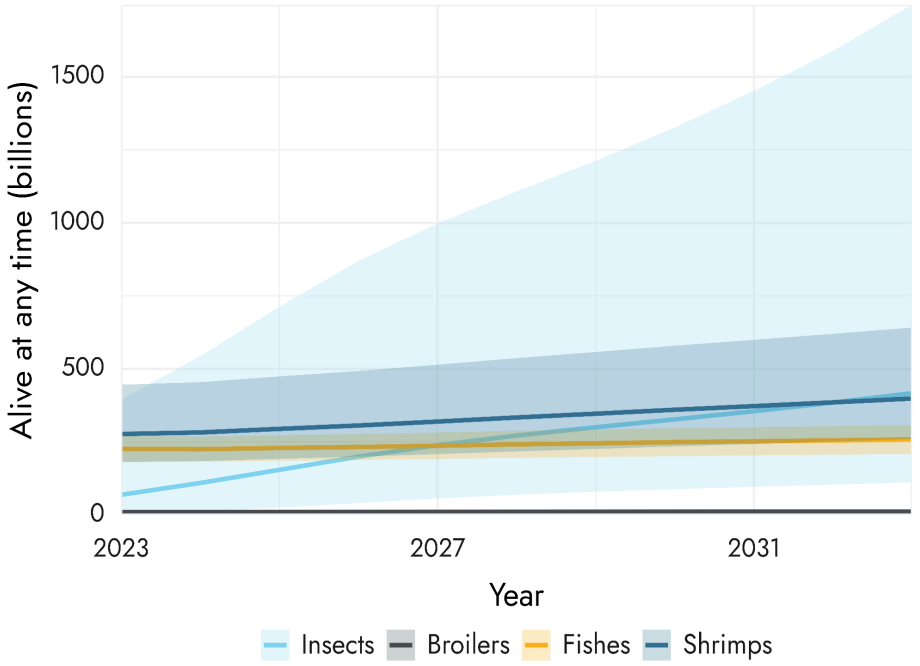
* **Disaggregating fish and shrimp tonnage forecasts:** The OECD-FAO report only provides aggregated forecasts for aquatic animals (including finfishes and shrimps) together under 'Fish'. We broke down the tonnage forecast into finfishes and shrimps using the historical share of finfish and shrimp aquaculture production reported by FAO (2025). We then assumed that the growth in share of aquaculture between 2012 and 2022 for each of shrimps and finfishes continues linearly from 2022 to 2033. We calculated the tonnes of shrimps and finfishes produced from 2023 through 2033 by applying the estimated share of aquaculture for shrimps and finfishes to the OECD-FAO forecasted aggregated tonnages.

** **Broiler chicken data had no uncertainty intervals:** Note that the FAO (2025) data for broiler chickens did not have confidence or credible intervals, so our forecasts for this group were also missing these.

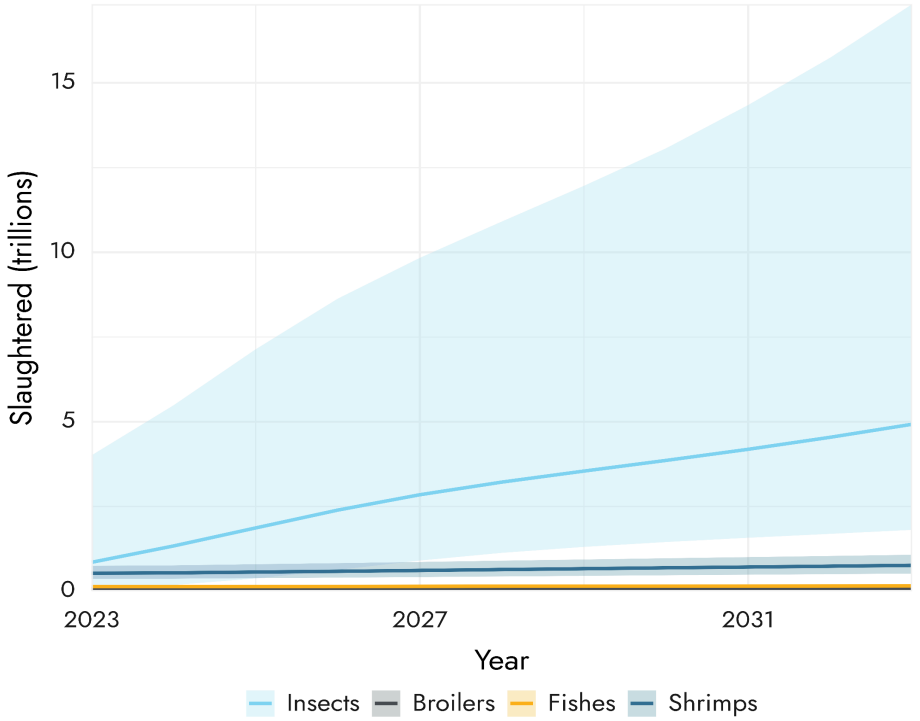
† **Calculating insect 90% credible intervals:** We took Shah's (2024) 5th percentile and 95th percentile as our lower and upper bounds respectively, and the median as our midpoint estimate.

Appendix 2: Graphs with credible intervals

Estimated number alive at any time from 2023–2033. Note that ‘Insects’ only includes black soldier fly larvae and mealworms.



Estimated number slaughtered per year from 2023–2033. Note that ‘Insects’ only includes black soldier fly larvae and mealworms.



References

Barrett, M., Chia, S.Y., Fischer, B., & Tomberlin, J.K. (2023a). Welfare considerations for farming black soldier flies,Hermetia illucens (Diptera: Stratiomyidae): a model for the insects as food and feed industry. Journal of Insects as Food and Feed, 9(2), 119-148. https://doi.org/10.3920/JIFF2022.0041

Barrett, M., Godfrey, R.K., Schnell, A., & Fischer, B. (2023). Farmed yellow mealworm (*Tenebrio molitor*; Coleoptera: Tenebrionidae) welfare: species-specific recommendations for a global industry. Journal of Insects as Food and Feed, 10(6), 903-948. https://doi.org/10.1163/23524588-20230104

Crump, A., Browning, H., Schnell, A., Burn, C., & Birch, J. (2022). Sentience in decapod crustaceans: A general framework and review of the evidence. Animal Sentience, 7(32). http://doi.org/10.51291/2377-7478.1691

FAO. (2025). FAOSTAT—Crop and livestock products. Food and Agriculture Organization of the United Nations. Accessed February 2025. https://perma.cc/5E56-89F2

Gibbons, M., Crump, A., Barrett, M., Sarlak, S., Birch, J., & Chittka, L. (2022). Can insects feel pain? A review of the neural and behavioural evidence. Advances in insect physiology, 63, 155-229. https://doi.org/10.1016/bs.aiip.2022.10.001

McKay, H., & McAuliffe, W. (2023). Quantifying and prioritizing shrimp welfare threats. Rethink Priorities. https://doi.org/10.17605/OSF.IO/4QR8K

Mood, A. & Brooke, P. (2019). Estimated numbers of farmed fishes living in global aquaculture. Fishcount. https://perma.cc/JK8Y-D3BW

Mood, A. & Brooke, P. (2024). Estimated farmed finfish numbers 2020 to 2022. Fishcount. https://perma.cc/E3D9-LS6J

National Chicken Council. (2025). U.S. broiler performance. National Chicken Council. Accessed February 2025. https://perma.cc/V2B3-L6ZR

OECD/FAO (2024), OECD-FAO Agricultural Outlook 2024-2033, OECD Publishing, Paris/FAO, Rome, https://doi.org/10.1787/4c5d2cfb-en

Ritchie, H., Rosado, P., & Roser, M. (2023) - “Animal Welfare” Published online at OurWorldinData.org. Retrieved from: 'https://ourworldindata.org/animal-welfare' [Online Resource]. Data source: Food and Agriculture Organization of the United Nations (2023) – with major processing by Our World in Data. “Meat, total - Producing or slaughtered

animals (animals) – FAO" [dataset]. Food and Agriculture Organization of the United Nations, "Production: Crops and livestock products" [original data].

Rowe, A. (2020). Insects raised for food and feed — global scale, practices, and policy. Rethink Priorities. https://perma.cc/S4G3-8PU7

Shah, S. (2024). Insect farming: investment trends and projected production capacity. Rethink Priorities. https://perma.cc/5WDK-K3ZC

Waldhorn, D. R., & Autric, E. (2023). Shrimp: The animals most commonly used and killed for food production. Rethink Priorities. https://doi.org/10.31219/osf.io/b8n3t

Welfare Footprint Institute. (n.d.). Welfare of Farmed Fish: Preliminary Appraisal Of Differences In The Welfare Of Top Farmed Fish Species. Welfare Footprint Institute. https://perma.cc/52HV-VN7E