



Beacon

TINY
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FUND

A series of key messages
from works by academics
useful for tackling
industrial animal agriculture
in developing countries

A project of Burning Questions Initiative

Issue 3 | August 2024

Seven studies are featured. They cover:

1. Factors shaping chicken and egg consumption in India.
2. Certification's impact on shrimp farming in Vietnam.
3. A political economic perspective on transforming the food system.
4. Feed production for pigs and chickens in Thailand.
5. The broader impacts of the farmed salmon industry's use of technical metrics.
6. Diverse groups tackling mega meat farms in Latin America.
7. Two approaches to improve farm animal welfare in Europe.

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1

Scudiero, Lavinia, et al. "Understanding household and food system determinants of chicken and egg consumption in India." *Food Security* 15, no. 5 (2023): 1231–1254. [link](#).

Chicken and egg consumption in India is low, uneven, and influenced by socio-cultural, household, and supply-side factors.

Efforts to influence chicken and egg consumption in India will benefit from nuance and clear targeting. It is important to consider factors such as India's low consumption of eggs and chicken meat, the uneven spread of consumption among households of different social classes, religions, gender compositions, etc., and lower prices in regions where poultry production is concentrated.

- This study explores the economic, socio-demographic, cultural, and food system factors that shape the consumption of chickens and eggs in India.
- Although average per-capita poultry consumption in India has risen in recent decades, it remains at low levels.
- Moreover, consumption is spread unevenly across the country, determined in part by supply-side factors.
 - Rural Indians have particularly low consumption.
 - Indians in the South and East have a higher intake of poultry products. This is likely driven by higher supply and lower prices (because poultry production is concentrated and intensifying in these regions).
- The study reveals several key features in poultry consumption patterns:
 - Income and price are significant determinants.
 - Socio-cultural factors and religion are major drivers (for example, Hindus and Sikhs consume less poultry products than Muslims and Christians, while historically marginalized caste groups consume fewer eggs but slightly more chicken than non-marginalized caste groups).
 - Gender and household dynamics influence consumption patterns (e.g., households headed by women are less likely to consume poultry products).



Why is this academic study particularly useful for addressing 'burning questions'?

- This study is relevant to CON2: "What are the drivers of increased meat consumption in LMICs? What are the most effective interventions and communication strategies to stop or slow the trend?"
- It is widely observed and reported that rising incomes, a growing population, and urbanization are key drivers and determinants of increased meat consumption in LMICs. This study tries to fathom the reasons why in spite of these developments in India, the country's average per-capita consumption of chicken meat and eggs remains low.

- Some campaigners consider demand from consumers in LMICs to be by far the most critical driver of the expansion in animal-source foods production. This study provides empirical evidence that rather than demand driving up production, it can be the other way round: The data suggest that in India, supply-side factors – especially the steady rise of higher productivity in the poultry industry in some parts of the country – lower prices, and this price drop helps to *drive up consumption*.
- However, the paper's authors found that this increase in consumption is "heterogenous" and does not apply across the board to all segments of Indian society.
- The study contains information about vegetarianism in India. Contrary to the belief of many that India is a predominantly vegetarian country, the study states that only 30% of Indians are vegetarians (that means the majority of Indians are non-vegetarians). But the authors also point out that vegetarianism does play a role in Indians' dietary patterns.

Deeper Dive

1. Aim and motivation of the study

- The aim of the study is to understand the determinants of poultry consumption in India.
- To achieve this aim, the authors analyze the economic, socio-demographic, cultural, and food system factors that contribute to consumption of chicken meat and eggs. Data from national surveys conducted by the Indian government in 1993-1994 and 2011-2012 are used. (More recent surveys have not yet been made available.)
- The authors consider learning more about the determinants to be important because India has been intensifying its poultry production rapidly. At the same time there is a perception that rising income, population, and urbanization is driving up demand for chicken meat and eggs.
- Indeed, meat consumption in general has seen an increase in recent decades. But in spite of these developments, the data show that average per-capita consumption of chicken meat and eggs remains low.
- The hope that poultry products can provide the nutrition needed by those who are malnourished has not been realized.

2. Consumption of chicken meat and eggs in India has risen over time, but remains comparatively low

- Between the two time periods examined in this paper (1993-1994 and 2011-2012), consumption of chicken meat increased sixfold. Egg consumption rose by 80% in rural areas and 30% in urban areas.
- However, consumption was so low in 1993-1994 that even these large increases translated to < 0.2 kg of chicken and 1-2 eggs per person per month by 2011-2012.
- In 2017, monthly consumption was estimated to be 6 eggs and 0.28 kg of chicken per person.
- Many Indians still cannot afford to consume poultry products regularly even though incomes have climbed and these products are becoming more affordable and more widely available.

3. Consumption is uneven and supply-side factors likely contribute to higher consumption in some regions

- Rural Indians consume the least poultry products, roughly half the amount compared to those living in urban areas. However, although urbanization appears to be a driver of egg consumption, all else being equal, urban households are no more likely to consume chicken.
- Households in regions where most poultry production takes place reported eating the most chicken and eggs. Poultry products are cheaper and more easily available in urban areas close to these production centers, which likely contributes to geographical differences in consumption.

- Mean urban chicken consumption in these areas was still only 0.21 - 0.26 kg per person per month in 2012, though.
- The overall low and uneven consumption brings into question the claim that the strong growth in India's poultry industry will translate directly to solving the country's malnutrition problem and improving everyone's nutrition.

4. A range of socio-cultural, religious, gender, household structure factors are also important in influencing consumption patterns. Examples:

- Religious and cultural traditions can affect when chicken and eggs are eaten, and by whom. For example, among some groups consumption may be lower during certain religious festivals, for menstruating women, and in the summer.
- Households headed by women were less likely to eat poultry products, as were households without boys. Women tend to be responsible for keeping their households free from "impure" foods (i.e., meat), which may contribute to the lower incidence of poultry consumption in households headed by women.
- Sikh and Hindu households ate less chicken and eggs per person than Christian and Muslim households.
- Caste groups with higher social status tend to have higher levels of vegetarianism.
- Households in marginalized caste groups ate fewer eggs than those from other caste groups, but equalled or slightly surpassed them in chicken consumption.
- Marginalized caste groups, especially women, sometimes stop consuming non-vegetarian food out of social pressure or to improve their social status.

2

Watanabe, Hiroki, and Fumikazu Ubukata. "Does international environmental certification change local production and trade practices? A case study of shrimp farming in southern Vietnam." *Human Ecology* 51, no. 4 (2023): 781–794. [link](#).

A case study of international environmental certification of shrimp farming in Vietnam shows little effect on farming methods and trade relationships.

NGOs implementing certification schemes such as international environmental certification (IEC) should take time to understand local production practices and economic relationships. Farming systems may or may not already meet global expectations, and local traders may have good reasons to resist change.

- IEC was introduced to a shrimp farming village in Vietnam by government agencies, NGOs, and a shrimp trading company. Goals included raising incomes, increasing mangrove forest area, and giving the company access to new markets.
- Local farming practices mostly already conformed to the new standards, and farmers and middlemen were reluctant to disrupt established trading relationships.
- Certified shrimp were sold into uncertified markets, and production methods barely changed.
- Failing to understand the local context may mean that IEC does not result in the desired outcomes.



Why is this academic study particularly useful for addressing 'burning questions'?

- This study is relevant to AGB3: "What impact do food industry standards and voluntary corporate commitments have on meat consumption and animal welfare in LMICs? How can commitments made by companies in higher-income countries be expanded to other markets?"
- Although this case study is not focused on animal welfare or meat consumption, it is of practical use to Beacon readers who are interested in shrimp farming in Asia, and/or using food standards and certification schemes from the Global North.
- It provides a concrete example that shows that the effect of "standards" and "corporate commitments" in LMICs is *highly context- and location-specific*.

Deeper Dive

1. What is IEC, and why is it used??

- To create an IEC, a third party establishes the scientific basis and sets up systems for tracking, auditing, etc. IEC is voluntary and market-based, relying on the participation of actors throughout the supply chain and on demand for certified products.

- IEC is used for three main purposes: (1) to solve environmental problems arising when the international trade of natural resources causes harm that is spread over multiple countries, and therefore can't be tackled effectively by regulations at the national level; (2) to provide exporting countries with access to markets that demand environmentally-friendly products; and (3) to benefit producers that meet the standards.

2. The effects of IEC depend on where and how it is implemented

- Case studies have come to mixed conclusions about the benefits and burdens of IEC.
- In one case, IEC helped farmers change to sustainable and higher-yield farming practices. In another, price premiums were too small to persuade farmers to change their methods. Others have argued that IEC places the cost of compliance onto small farmers, and unfairly expects them to adapt to global standards.

3. IEC was recently introduced for mangrove shrimp farming in Vietnam

- This study examined mangrove shrimp farms in "Village V" in southern Vietnam. This location was of interest because IEC had recently been introduced there, and mangrove areas are unusual ecosystems that may affect how farmers respond to IEC.
- IEC was introduced by the Department of Agriculture and Rural Development (DARD), international NGOs, and "Company A", a major seafood-trading firm.
- As well as increasing local incomes, the goals of DARD and the NGOs included providing an incentive to farmers to increase the amount of mangroves in their ponds.
- Company A was keen to access certified shrimp in order to enter certain international markets.
- IEC requires all participants in the supply chain to be certified.
- Certified farmers and middlemen would be paid a premium for shrimp sold to Company A. If they sold >50 kg of shrimp to Company A, they would also be compensated for "provision of forest environment services".

4. Certified farmers did not change their methods, and continued selling to uncertified buyers

- The first farmers who participated in IEC in Village V were selected because they already met, or were close to meeting, the standards. Mangrove shrimp farming requires a healthy agro-ecosystem, and the farmers were already proud of the quality of the shrimp.
- Importantly, existing relationships between farmers, middlemen, and wholesalers largely continued. These actors placed a high value on longstanding relationships built on trust and fairness as well as price. Company A was not perceived as trustworthy by all actors.
- In addition, perhaps because they had already covered the costs of certification, Company A did not offer high enough prices to convince many farmers, middlemen, and wholesalers to sell to them, even with the premiums.
- The outcome was that shrimp from certified farmers continued to be sold as uncertified in international markets.

5. Efforts to change practices using IEC may lead to unexpected outcomes

- Shrimp farming in Village V already conformed to Western notions of sustainability.
- Moreover, the local economy was largely based on *trust relationships*, and resisted attempts to change it.
- This and other case studies show that approaching IEC as a "one-size-fits-all" tool is likely to have unanticipated consequences in some locations or circumstances.

3

Resnick, Danielle, and Johan F. M. Swinnen, eds. *The political economy of food system transformation: Pathways to progress in a polarized world*. Oxford University Press, International Food Policy Research Institute, 2023. [link](#).

To transform animal agriculture and the current food system, it is important to understand the political economic forces that shape it.

The food system, in which industrial animal agriculture is embedded, involves a highly complex mix of power dynamics, interest groups, institutional structures, productivity, trade, and consumption on local, national, and international levels. A political economy perspective and systems approach are very useful to those seeking to understand and transform them.

- The food system – the complex web of activities that is required to grow, process, distribute, consume, and dispose of food – involves a multitude of actors.
- These people, companies, institutions, and organizations represent a wide range of values, interests, aims, and perceptions. This diversity, together with the power dynamics and tradeoffs that inevitably arise, influences efforts to affect the system.
- Political economy, which studies the interaction between economic and political systems, offers a valuable perspective on how current food systems were shaped and what it will take to transform them.
- This book covers issues including “interests, institutions, and power in the food system, the diversity of coalitions that form around food policy issues and the tactics they employ, [and] the ways in which policies can be designed and sequenced to overcome opposition”.
- The book introduces an overall framework for thinking about policy reform, and analyzes examples of successful and unsuccessful attempts at food system change.
- Many examples are from LMICs. Topics especially relevant to Beacon readers include efforts to reduce meat consumption and redirect agricultural subsidies.

4

Moungsree, Savitree, et al. "Greenhouse gas emissions and carbon footprint of maize-based feed products for animal farming in Thailand." *Environmental Science and Pollution Research*, 31 (2024): 2657–2670. [link](#).

Feed production for pigs, broiler chickens, and laying hens in Thailand has high GHG emissions due to the use of maize grain, fish meal, and soybean meal.

Feed given to pigs, broiler chickens, and laying hens account for 92% of all feed produced in Thailand. High concentrations of fish meal make layer feed the most GHG-intensive, while pig feed results in the lowest emissions per tonne of feed. Rotating maize with soybeans and replacing high-emissions ingredients would reduce both emissions and costs.

- Maize grain, soybean meal, and fish meal are major ingredients of animal feed produced in Thailand.
- Producing these ingredients leads to relatively high GHG emissions. In particular, as marine fishing is very energy-intensive, fish meal is up to 100x more GHG-intensive than other ingredients.
- Layer feed includes particularly large amounts of fish meal (to improve egg quality) and is therefore the most GHG-intensive type of feed.
- Ingredients account for 97% of emissions and 94% of costs. Energy use at the feed mill accounts for only a small fraction of both.
- Growing maize in rotation with soybeans, while also replacing fish meal with soybean meal, replacing imported wheat with domestic tapioca, and switching to renewable energy, would result in a 40-50% reduction in GHG emissions. It would also decrease production costs by about 30-60 USD per tonne of feed.
- Note that the authors focus on emissions reductions *per tonne of feed produced*. The study is not aimed at addressing the scale of production and the issue of a possible rise in *total* emissions if animal production continues to go up.

5

Martin, Sarah J., and Charles Mather. “‘Finprint’ technopolitics and the corporatisation of global food governance.” *Area*, Oct. 2023, p. area.12907. [link](#).

The farmed salmon industry uses technical metrics to claim their product is sustainable, gain power, and export the industrial aquaculture model to the Global South.

Groups representing large-scale salmon aquaculture have focused heavily on decreasing the amount of feed necessary to produce a certain amount of fish. Demonstrating “sustainability” via this very one-dimensional metric has helped corporations to gain a seat at the global food governance table and acquire considerable power to shape future food systems along industrial lines.

- The feed conversion ratio (FCR; the amount of feed consumed per unit of meat produced) is widely used within salmon aquaculture as an indicator of sustainability. A lower FCR is claimed to represent a more efficient use of resources.
- By this metric, farmed salmon compares favorably to other forms of animal protein.
- Measuring FCR requires expertise, technology, and organizational infrastructure. This is most readily available on industrial farms.
- Offering this “sustainability solution” and metric has helped the industry gain access to global food system fora such as the 2021 UN Food Systems Summit. This grants them both legitimacy and influence over future food systems.
- At food and climate summits, the industry argues that aquaculture in the Global South should adopt FCR as its primary metric and work to improve it.
- As Global South aquaculture produces a much higher volume of fish than salmon farming, this offers a new market for providers of fish feed and measurement infrastructure.
- However, corporate promotion of the industrial model risks sidelining alternative modes of food production that promote livelihoods and other social goods alongside productivity.
- The authors point out, though, that many local communities are resisting the imposition of the industrial model and are trying to shape their food systems in line with their own priorities.

6

Vázquez, Karen Hudlet. “**Interconnected violences and interconnected resistances: Alliances for resisting meat factories in the Americas.**” Tiny Beam Fund, July 25, 2024. [link](#).

Not simple and easy for different organizations (human rights, environmental, food sovereignty, animal rights/vegan) tackling mega meat farms in Latin America to form alliances.

Human rights, environmental, food sovereignty, animal rights/vegan organizations in Latin America and the U.S. hoping to form alliances to resist mega meat factories and the meat industry need to understand and accept the fact that the way other groups view food systems and issues such as economic development, justice, technology can be very different from their own.

- Given mega meat farms' multiple negative impacts on humans and non-human animals, it is no surprise they face opposition from different actors, including those in Latin America.
- These actors (e.g., local communities, indigenous people, food movements, vegans, environmentalists), all want to stop factory farming. But their approaches to meat production and (non) consumption differ in myriad and significant ways. Therefore, one cannot assume they are all natural allies or pursuing a common vision. Potential tensions between them are real.
- To understand how these organizations in Latin America and the U.S. can form alliances and networks, it is necessary to comprehend the different lens through which these diverse organizations view the meat industry – perspectives that are influenced by how they look upon issues such as economic development, justice, and technology.
- One also needs to be aware of the full repertoire of their actions which are in turn shaped by the unique goals of each organization.
- There are also dissimilarities in how they perceive food systems and what they consider to be good food.
 - Human rights, environmental, and food sovereignty groups regard agribusiness as a form of extractivism; they denounce the uneven distribution of the harms and benefits of the industrial food system.
 - Vegan and animal rights organizations focus on the commodification of animals and violence done to them, but may not be concerned with other aspects in the industrial grain-oilseed-livestock complex such as feed production.

7

Molnár, Mariann. "Enhancing farm animal welfare through animal housing technology certification and alternative farming systems." Tiny Beam Fund, July 27, 2024. [link](#).

Farm animal housing technology certification systems and alternative farming practices are two good ways to address intensive animal farming in European transition economies.

Farmers in European transition economies that have invested in intensive methods often find they are very limited in their ability to improve animal welfare. Housing technology certification systems such as that used in Switzerland can help them improve animal welfare. Another good approach is alternative farming practices that have short value chains and without costly fixed technologies.

- Transition economies in Europe – whether EU Members, candidate countries or non-members – are increasingly facing pressures to intensify animal agricultural production.
 - Countries of Central Eastern Europe are already transitioning to intensive systems.
 - Countries in the Balkan region have managed to retain most of their small-scale farming, yet many are contemplating the need to invest in large-scale animal farming operations.
- Contrary to the common belief that farmers are solely responsible for the treatment of farmed animals, farmers are only partially accountable for on-farm standards. Multiple players in the value chain, including industries that supply feed, farm animals, and housing tools and equipment have direct influence on the conditions animals are subjected to on farms.
- One approach that has shown promise to help these farmers improve on-farm animal welfare is the use of *housing technology certification systems*, such as that used in Switzerland.
 - It is a flexible, data-driven approach to assess housing technologies before they are sold to farmers.
 - This system, carried out by authorities in collaboration with technology suppliers and farmers, enables tool and technology innovation, offers transparency, and provides additional checks and balances to ensure that housing technologies prioritize animal welfare.
- Another approach is to adopt *alternative farming practices* that have short value chains, do not need large investments in fixed technologies, and allow farmers to access growing niche markets.

Brief mention (non-academic reports):

1 Sutton, William R., et al. *Recipe for a livable planet: Achieving net zero emissions in the agrifood system*. Washington DC: World Bank, 2024. [link](#).

- “The global agrifood system has been largely overlooked in the fight against climate change. . . . the first comprehensive global strategic framework to mitigate the agrifood system’s contributions to climate change, detailing affordable and readily available measures that can cut nearly a third of the world’s planet heating emissions while ensuring global food security. . . . This practical guide outlines global actions and specific steps that countries at all income levels can take starting now, focusing on six key areas: investments, incentives, information, innovation, institutions, and inclusion. Calling for collaboration among governments, businesses, citizens, and international organizations. . . .”

2 Food and Agriculture Organization (FAO) of the United Nations. *The state of world fisheries and aquaculture 2024*. Rome: FAO, 2024. [link](#).

- This report “provides the most up-to-date and evidence-based information, supporting policy, scientific and technical insights on challenges, opportunities and innovations shaping the present and future of the sector, for the benefit of a wide and expanding audience of policymakers, managers, scientists, fishers, farmers, traders, civil society activists and consumers.”
 - Part 1: “the most up-to-date review of world fisheries and aquaculture production and utilization”.
 - Part 2: “the role of FAO and its partners to catalyse the transformational changes required to support aquaculture expansion and intensification, effective management of global fisheries and upgrading of aquatic value chains”.
 - Part 3: “the high-impact challenges and opportunities of the untapped potential of utilizing whole fish and by-products to improve food security and nutrition, expounds on the role of aquatic food systems in providing critical climate, biodiversity and environmentally sound solutions, and highlights the importance of their integration into national and multilateral processes”.
 - Also includes “an outlook on future trends up to 2032 based on projections”.



About Beacon

A project of Burning Questions Initiative

Why?

- Tiny Beam Fund's flagship *Burning Questions Initiative* produces a list of 'burning questions'. These questions were contributed by over 25 organizations and funders critical of and working to tackle industrial animal agriculture, especially concerning low- and middle-income countries (LMICs). These questions focus on topics that they would most like academic researchers to address and answer. The current (2023) list is [here](#).
- Every 'burning question' is complex and multifaceted. It would be foolish to believe that there is a single, simple, definitive answer to a question.
- Addressing these questions requires welding together many pieces of nuanced, contextualized information, research findings, and perspectives drawn from a broad knowledge base, a rich knowledge bank of studies by academic researchers. It also requires extracting key messages from these studies.
- This welding and extracting endeavor is arduous. But, "a journey of a thousand miles begins with a single step". We hope that our curated series of key messages – named *Beacon* – will serve as a beacon, guiding all those keen to take the first step.

Who's the audience?

- Those who have contributed to the 'burning questions', those who are curious about these questions, those who are interested in using the research undertaken by academics to address the questions.
- Anyone can access *Beacon* on our website. It is easy to read and understand. No academic jargon!

What's in it?

- Each issue contains 6-8 main items. These are works by academic researchers in peer-reviewed journals from the past couple of years. Also included are reports written for Tiny Beam Fund by recipients of its *Burning Questions Initiative* fellowship awards (they are all PhD holders or PhD students close to obtaining their degrees). 1-2 'Brief mention' non-academic reports may also be included.

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