

A Policy and Tax Analysis on the Current Problems of Factory Farming and Its Solutions

Fei Gao*

University of California, Irvine

*Corresponding author: Feig3@uci.edu

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Abstract: As global meat consumption increases, factory farming has become the primary production method. Factory farming minimizes the production costs and maximizes the profits and production. However, countless negative consequences have been brought by such a way of animal farming, including but not limited to contributing to global warming, environmental pollution, diseases, and the inhumane treatment of animals. This paper analyzes case studies from around the world to reveal the existing problems in countries' general legal and tax systems. Then provides potential solutions.

1. Introduction

Global meat demand has tripled during the last 50 years. Meat has become a crucial part of humanity's diet; pork being the most popular. The world now produces more than 340 million tonnes each year [1]. To cope with increased demand, production has increased. Asia is now the largest producer; production is 40 to 45 percent of global production. North America and Europe, the former largest, now produce 15 and 19 percent, respectively [1].

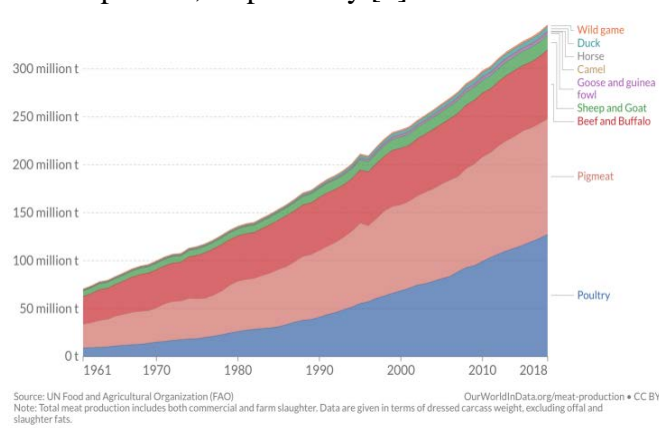


Figure 1. Meat production by livestock type. Reprinted from Our World in Data [1].

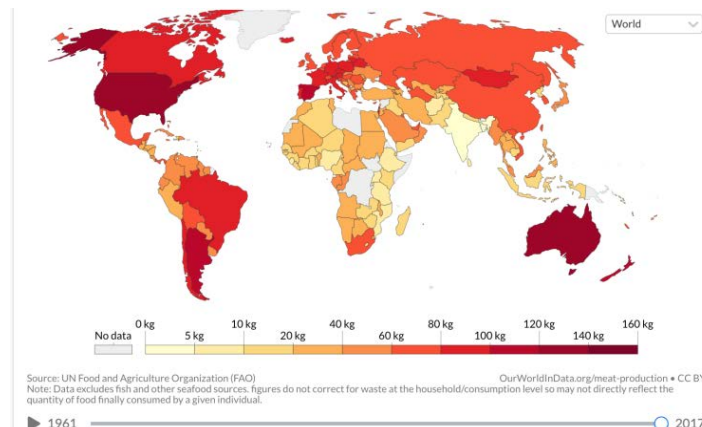


Figure 2. Meat supply per person of 2017. Reprinted from Our World in Data [1].

Factory farming, also known as intensive animal farming, is the default process of meat producers; maximizing profits while minimizing production costs. Factory farming includes, but is not limited to, producing feed, raising livestock, and slaughtering them to produce meat and other products. Factory farming is the main contributor to greenhouse gas (GHG) emissions, the livestock sector’s GHG emissions increased by 51 percent between 1961 and 2010, spurred by a 54 percent increase in methane and nitrous oxide emissions from livestock manure [3]. The animal sector is responsible for 18 percent of GHG emissions [4]. Factory farms also constantly overlook and violate human rights and human health. For example, in “Rape in the Fields,” an episode of the investigative program Frontline, offered an inside look at the sexual abuse of undocumented migrant workers in these poorly regulated animal farms [5]. Factory farm workers are also exposed to numerous other safety hazards, such as respiratory disease pathogens like avian flu and antibiotic-resistant bacterias. According to a 2012 report, about 66 percent of the emerging diseases in humans originated from animals and, on average, one or two new diseases emerge annually [6].

The increasing demand for meat further exacerbates the imbalance of the global food supply, worsening global hunger. The land grown for animal feed is much more than the cropland to feed humans without an animal intermediary. As shown below in Figure 3, 77 percent of agricultural land is used for factory farming-related purposes, while 23 percent is used to provide crops for human consumption. According to the report, with rising incomes in the developing world, demand for animal products will continue to surge. As Figure 3 sums up, 11 million sq km used for crops provide more calories and protein for the global population than the area used for livestock. The latter is four times the former.

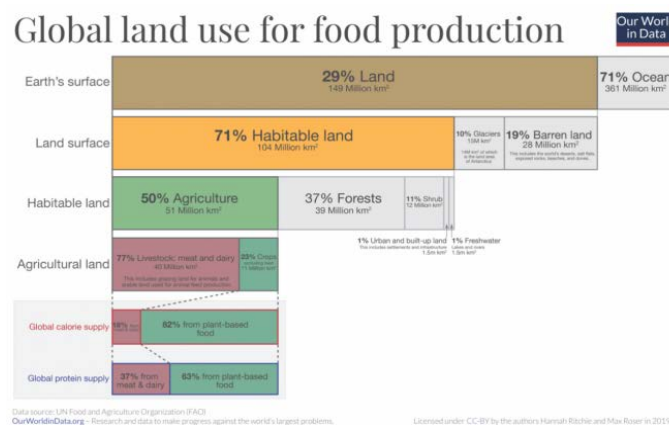


Figure 3. Global Land Use for Food Production. Reprinted from Our World in Data [2]

This paper aims to explore ways to regulate and improve the current factory farming practices, from a legal standpoint.

2. Key Concerns of Factory Farming

This paper uses mostly North American and European case studies for two reasons: (1) The West has various resources on providing comprehensive data and policy reports. As leading figures in forwarding solutions and creating policies on regulating the factory farm industry, policy analysis for these regions could provide a model for other localities to form their framework. (2) By looking at the problems the West is facing, the reader could conceptualize and reveal problems in their purview, developing and developed countries alike.

2.1 Problems In Factory Farm Processes

The consolidation of the factory farm industry has paved the way for corporate ownership of concentrated animal feeding operations (CAFOs). Global-sized firms own almost every aspect of the production, processing, and marketing of animal products. For example, Cargill and ConAgra, two of the largest factory farming corporations in the U.S., go through the whole process from growing animal

feed to processing their animals by themselves. This operational model is different from traditional, small-sized livestock operations. In 1950, 95 percent of U.S. poultry farmers were independent producers. However, by 1994, 99 percent of U.S. poultry production was done either with independent contractors or directly by big corporations [8]. The consolidation of the industry and the global market's growing demand for animal products has pushed companies to use the CAFO method to raise and produce their meat. Several problems within this style of operation need to be addressed.

First, corporations with CAFOs often do not treat their animal's waste. Untreated waste pollutes the environment. In 2012, livestock and poultry on the largest CAFOs produced 369 million tonnes of manure: this was almost 13 times more waste than that of the entire U.S. population of 312 million [9]. Around the world, human waste treatment is required by law to be done in carefully designed sewage systems and the treatment process is subjected to strict legal regulations. However, animal waste from factory farms is stored in open-air man-made lagoons. Some of the manures have been applied as fertilizer to farm fields, which brings more problems than benefits to the environment [10]. The animals' waste contains not only pathogens but also toxic metals and environmentally persistent chemicals such as dioxins. Laying these wastes directly on the farmland would add toxicity to the soil and the farm crops. Animals running across the fields would carry on the pathogens and spread them to other areas, causing more problems [11]. The biosolids (solid animal waste) stored in lagoons consist not only of feces but of antibiotic residues, cleaning solutions and other chemicals, and sometimes animal body parts. Most lagoons are lined only with clay and can easily leak their waste into groundwater. Untreated waste from CAFOs also pollutes the air with airborne chemicals and has strong odors. The troublesome air emissions create health problems and damage the quality of life for workers and neighboring communities. The pollution makes the area around the farm uninhabitable and lowers property values, putting undue hardship over neighbors' livelihoods.

Second, CAFOs produce air pollution. The farms produce two significant pollutants that are potent greenhouse gases: methane and nitrous oxide, along with ammonia, hydrogen sulfide, and other noisome chemicals. CAFOs release large amounts of particulate matter in dry regions where manure turns easily into dust and the particulate matter is rapidly dispersed. Past studies have found high levels of antibiotics and antibiotic-resistant genes in air samples collected in feedlots [12-13]. Similar problems are shown in other countries that have an animal farming industry. For example, China's pig industry currently produces more than half of the world's pork and produces more than 600 million tons of manure annually. The manure is scattered carelessly across China's countryside. These manures are difficult to be recollected and processed properly. The dissipation of animal wastes contributes to a large amount of GHG and consequently to climate change, not to mention various other harms that the waste has caused the environment [14]. Xu Cheng, a professor at China Agricultural University, has estimated that only 3 percent of China's large and medium-sized factory farms have facilities to treat animal waste [15]. From the data, it is reasonable to assume that countries are facing similar animal waste disposal problems in general. This is a dire concern that deserves the spotlight.

Moreover, the current operation style of livestock farming contains high risks for financial loss in big meat corporations. More and more investors are considering factory farming an unsustainable way to run a large corporation. One of the biggest financial consequences is fines resulting from failure to comply with a country's health and environmental regulations. In 2014, an estimated 3 billion USD of the economic damage was caused by avian flu in the U.S. [17]. The cost of cleaning up the soil under pig and dairy farms in the United States is estimated at 4.1 billion USD [18]. In addition, the world's 2nd largest meat processor and marketer Tyson Foods had to pay at least 14 million USD in fines and settlements just for pollution problems between 2003-2018 [19].

Factory farms also threaten global security issues from the overuse and misuse of antibiotics. The use of antibiotics in factory farms not only contributes to the rise of antibiotic resistance in the human body but also prepares for outbreaks of animal pandemics, such as swine flu (H1N1), avian flu (H5N1). For example, about 70 percent of all antibiotics by volume in the U.S. are used in animal farms [16]. Recognizing the shortcomings and potential threats of the current practice, countries have started regulating such issues. In October 2015, California became the first state in the U.S. to ban frequent

antibiotic use in farm animals. EU legislation on veterinary medicines is currently under review; this could lead to a trend of setting new regulations on the frequent preventive use of antibiotics in intensive farming.

Humanity has also grown more intolerant of food safety violations and animal cruelty. A 2008 investigation of Hallmark/Westland Meat Packing Company, revealed animal cruelty and health concerns. The investigation forced them to recall 65 million kilograms of meat, the largest in U.S. history [20]. The company declared bankruptcy after a subsequent class-action lawsuit. Another more recent example is the consequences suffered by the medical research firm Santa Cruz Biotech. The company was ordered to pay a 3.5 million USD fine and its license was revoked after allegations of mistreatment of animals [21].

Investors are becoming increasingly sensitive to the high-risk nature of the factory farming practices of the food and retail companies in their portfolios. According to a report by Farm Animal Investment Risk and Return (FAIRR), a 1.25 trillion USD coalition of investors that aims to put factory farming on the investor agenda, animal factory farms are vulnerable to at least 28 environmental, social, and governance (ESG) issues that may adversely affect companies' financial performance and investor returns[22].

2.2 Legislation Problems Associated With Factory Farms' Behaviors

Legislations and tax policies around the world prospered factory farms. The paper uses several examples to illustrate the problems and loopholes in current laws.

2.2.1 General Regulations

Unlike other large industries, such as coal, automotive, and steel industries, factory farms are not subject to such stringent rules and regulations. Using the U.S. as an example, many agricultural statutes do not have the power to regulate the farming industry. For example, the Animal Welfare Act of 1966 (AWA) protects species facing extinction but excludes farm animals. This gives corporations the freedom from federal enforcement and leaves state governments the sole enforcer of state legislation protecting farm livestock. In the U.S. there are only two major laws that serve to protect farm animals. The first is the Food and Rest Act requires livestock to be unloaded, fed, watered and rested for five consecutive hours after 28 hours of travel. The second is the Humane Slaughter Act (HSA), which requires that livestock be rendered insensible to pain before slaughter.

In addition, the current policies benefit meat production companies in several ways. One of them is the lack of a comprehensive framework on-farm inspection and periodic reporting to increase farm operation transparency. For example, in the U.S., several states such as Iowa have passed the "Ag-gag" law [23], which prohibits undercover investigations that reveal unlawful practices inside the farms. In addition, the "quick reporting bills" passed by states have also undermined animal rights organizations' actions by asking them to conduct evidence reports on an instance by instance basis, which eliminates becoming powerful evidence of these farms' large-scale health and animal treatment violations.

There is also a lack of regulations on pollution control of factory farms. For example, the National Pollutant Discharge Elimination System of the U.S. (NPDES) regulates water pollution from certain sources that release pollutants into water in the U.S. The regulation requires only large corporations that release untreated manure into waterways to obtain an NPDES permit. This program fails to provide enforcement on all types of factory farming facilities. Also, the program failed to address other important aspects such as putting waste in lagoons or spraying the manure on cropland. Leakage from lagoon and farmland that runs off during rain is recognized as a type of agricultural stormwater, which is regulated by law as a nonpoint source and does not require companies to hold a permit [24].

The COVID-19 pandemic has revealed the fragility of the current global food supply chain, which is controlled largely by big corporations. As the need for social distancing closed the world, disruptions in the supply chain and demand forced farmers to throw away products and kill their animals. Border closures across the globe have been hampering food transport. These challenges are good reasons for people to think about their food choices and where it comes from. An economic analysis from the U.S.

nonprofit National Sustainable Agriculture Coalition estimated a sales decline of up to 688.7 million USD across major local and regional markets in the U.S. from March to May 2020, accumulating up to 1.32 billion USD in a total loss to the country's economy during that same period [25]. The U.S. federal relief programs have tended to deliver support to farms working for large corporations instead of local and smaller farms.

Big-name companies such as Tyson take up the majority of the market share worldwide, pushing independent farmers further to the brink of insolvency. With this grand picture in mind, big corporations are usually the ones in the market that are able to afford services to get tax exemptions and government subsidies on operating animal farms. The following section discusses current tax problems that create more factory farming.

2.2.2 Tax Law Analysis

Currently, the meat production industry is affected by tax concessions, a.k.a. the levying of different tax provisions to provide favor upon the industry [26]. A country's tax system affects the current animal farming practice in many ways. Taxes such as income tax and estate tax influence a farm's profits and capital inputs on farming activities. Farms have a relatively low burden when it comes to estate taxes. For example, the individual estate tax exclusion under U.S. law has increased from 675,000 USD in 2001 to 11.18 million in 2018, while the tax rate on the taxable estate has fallen from 55 percent to 40 [27]. Using data from USDA's 2019 Agricultural Resource Management Survey (ARMS), Economic Research Service estimated the impact of the estate tax for the roughly 32,174 farm estates likely to have been created in 2020. By estimation, 0.63 percent of all farm estates would have been required to file for an estate tax return. After accounting for tax adjustments, deductions, and exemptions, 0.16 percent of farm estates were estimated to owe estate taxes in 2020. In the United States, federal income taxes take up the largest portion of a farmer's expenses [27].

Furthermore, Countries like the U.S. and the U.K. are currently using tax policies (for example, Research & Development tax) to advance technological change in animal farms. However, the review found that Research & Development (R&D) tax credits have the downside of incentivizing companies to invest more in projects with higher private returns, and less in projects with greater social returns. This outcome suggested that R&D credits may not be the most effective vehicle for resolving the innovation gap in factory farms and promoting better animal treatments.

Local tax policies also have a great impact on farm operations. Oftentimes, these local policies fail to achieve their purpose of the lack of supporting regulations and strict requirements. For example, of primary concern, the Iowa State law, Section 427.1, Subsection 19, Paragraph e introduced property tax exemption on animal farms [28]. The farms are allowed to claim the exemption for having a pollution control device. The pollution devices include manure pits and lagoons. The purpose of Iowa's tax exemption was to encourage farms to control pollution of the air and water. However, farms are able to claim this exemption on the manure pits, even though these pits are later pumped out and the manure injected or sprayed onto the ground where it often directly enters the waterways and air. pollution-control property.

3. Proposed Solutions

The analysis in Section 2 called for improvements over the current laws and regulations on factory farming. This paper proposes possible solutions that governments could implement to improve the current situations with factory farms.

3.1 Change In Legal System

Creating supervising structures and adding new food label regulations could improve factory farm behaviors and reduce their negative consequences.

3.1.1 Establish Local Regulatory Structure

The Animal Welfare Body (AWB), originally proposed by past researchers for humane animal experimentation, is a kind of regulatory structure to realize a more humane way of animal farming in each stage of the farming process [29]. It could be established as a ground-level department that fulfills oversight and advisory functions on animal treatments, such as housing quality, food quality, care, and slaughterhouse procedures while providing support for the implementation of legal requirements. Although AWB is still young in its experimental age, it would still be a fitting solution for animals in the factory farm industry, which relies heavily on CAFOs.

Since the birth of the AWB idea, they have been going through test runs in European countries. The European system is one of the strictest and most advanced systems that regulate animal welfare, and it provides a useful model for other countries to follow. A case study insight is the European Directive 2010/63/EU, which requires breeders, suppliers, and users of laboratory animals to have an AWB to protect animal welfare and harmonize experimental standards while reassuring the public that research is following the appropriate procedures [30]. European AWBs oversee and advise companies and workers on complying with Europe's legal requirements. According to European Law, an AWB must be set up in every institute that keeps, breeds, and uses animals for research. The same could go for factory farms. An AWB must include at least the person or persons responsible for the welfare and care for animals; additionally, a designated veterinarian is required to be included to provide consultation services. All meetings of European AWBs have been recorded and available for the public to ensure transparency. All interventions from European AWBs or the corporate side have been recorded to be available for inspections.

The AWBs could promote communication and education among the regulation committee, lawmakers, and factory farm workers. The AWBs provide instant feedback for corporations to comply with animal protection laws. It is a feasible way for countries to micromanage factory farms.

3.1.2 Labeling Reflexive Law

Food labels have significant roles in impacting consumers' product choice behaviors. Consumers usually stop buying products with labels that are perceived as environmentally harmful. For example, the use of palm oil in products has since become less and less popular among western consumers for palm oil farms' actions on destroying tropical rain forests and leading animals to extinction. This paper proposes a new regulation on food labels to reduce factory farms' negative impacts. Countries could require companies to include information such as whether the farms treated animal wastes properly on their product packaging. This label could pressure corporations into exercising better animal waste management. Consumers could also choose to buy products from companies that use proper waste management, and such buying behavior could motivate companies to practice better and more humane factory farming operations.

From its logic, food labels represent a type of reflexive law. Reflexive law is an information-based regulatory approach. Reflexive laws have advantages such as disclosing information to fully inform the public and requiring less administrative effort from the government [31].

To test the effectiveness of reflexive laws, a case in point is China's great progress in reducing agriculture pollution since it conducted the first investigation of the national survey of pollution sources in 2013 [32]. Open data access and more data encourage more Chinese institutions to conduct environmental studies on factory farms pollution. China then set pollution thresholds and required companies who exceeded such thresholds to warn the general public by methods such as labeling their products.

3.2 Change In Tax Law

Changes to a country's tax system can be used to promote better consumption choices and animal treatments.

This article proposes the introduction of meat taxation to

A "sin tax" is a tax applied for products or services that the government considers harmful to humans, above basic taxation. These products generate a proportionally high cost when using or consuming them, in terms of healthcare and other public services. The idea of a "sin tax" is to curb the

consumption of such products and reduce negative consequences induced by the consumption. A case in point is Mexico’s sugar tax on soft drinks. The sugar tax has been successful in reducing Mexico’s residents’ overall consumption of soft drinks [33]. The government has planned to use the tax money to implement free drinking water stations in schools and public spaces [34].

Lawmakers in Germany, Denmark and Sweden are proposing more taxes on meat. In Germany, the standard value-added tax (VAT) is 19 percent, but most food, including meat, is seven. German lawmakers across their political spectrum have proposed raising the tax on meat to 19 [35].

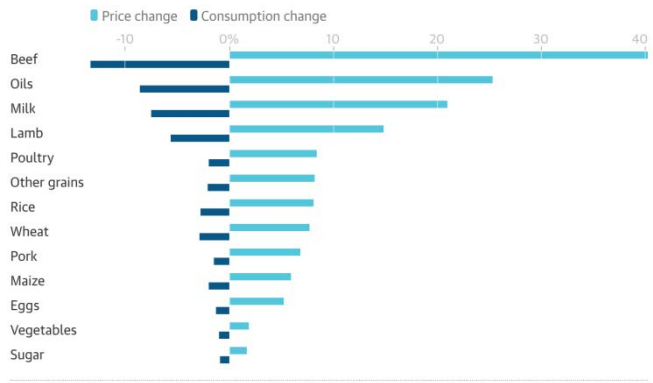


Figure 4. Projection of increasing meat product price and its correlated decrease in consumption [36].

In addition, it is important to adjust the consumer tax on meat products so that the price truly reflects the consequences of meat consumption. The new price could potentially deter people from purchasing more meat. Governments could utilize the increased tax revenue in funding studies such as minimizing the negative impacts of factory farms and proposing a better way of animal farming. environmental A case in point is the True Animal Protein Price Coalition funded by the European Union. This coalition aims to tax meat products by proposing a new calculation method that includes all external costs of pollution and health [37].

A common criticism of a meat tax is it would decrease farmers’ incomes, forcing them below the poverty line. However, this type of concern could be resolved by redirecting tax revenue raised from the meat tax to support farmers transitioning their operations from animal farming to crops.

A 2016 analysis of meat taxes worldwide found that levies of 40 percent on beef, 20 percent on dairy products, and 8.5 percent on chicken would save about 500,000 human lives annually while significantly cutting down GHG emissions [38].

4. Conclusion

Factory farms are one of the main sources of GHG emissions. Along with contributing to global warming, factory farms’ by-products (manures, air-borne chemicals, and particulate matters) are harmful to the environment and people’s health. As discussed in this paper, factory farms are becoming less and less financially stable due to problems brought by the current operation style (CAFOs). The problems of factory farms should not be ignored and are the prime research subjects of this paper.

Laws and taxes are major engines that drive changes in our society. By advancing changes in countries’ general legislative and tax systems, there’s hope that factory farms could have a less negative impact on the world.

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