

**Czech University of Life Sciences Prague**

**Faculty of Economics and Management**

**Department of Humanities (FEM)**



**Bachelor Thesis**

**Ethical issues in intensive animal farming.**

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## BACHELOR THESIS ASSIGNMENT

Polina Sergeeva

Economics Policy and Administration  
Business Administration

Thesis title

**Ethical Issues in Intensive Factory Farming**

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### Objectives of thesis

This thesis will consider the ethical issues raised by intensive factory farming and meat production. These issues include the moral status of animals themselves and connected concepts of animal welfare, the environmental consequences of factory farming, and the impact on employees. The thesis will present the main features of the debate on such issues and investigate attitudes towards them among consumers and the general public, including tracing the reasons for increased awareness and concern about them. The research will also discuss how industrial farms operate and how animals are treated. Finally, it will consider how these ethical issues are acknowledged and regulated by government and the producers, and what alternatives exist.

The main goal of the practical part is to research young people' attitude towards different types of meat, their habits in terms of meat-eating, their knowledge about ethics of factory farming, and their attitudes towards alternatives.

### Methodology

The theoretical part will explore the philosophical debate defining animal welfare, and connected scientific literature concerning pain in animals, as well as the contemporary forms and effects of factory farming and the other ethical issues it raises.

The practical part involves a quantitative survey of young people from Russia and Europe, exploring habits of meat-eating and their attitudes towards and knowledge of factory farming and their alternatives.

**The proposed extent of the thesis**

40-50 pages

**Keywords**

animal welfare, factory farming, environment, food safety, meat, consumer choice, agriculture

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**Recommended information sources**

KEMMERER, L. (2006). In Search of Consistency: Ethics and Animals. Leiden: Brill.

MIYUN, P., and Peter SINGER. 2012. The Globalization of Animal Welfare: More Food Does Not Require More Suffering. Foreign Affairs. 2, March/April 2012, Vol. 91, pp. 122-133.

SINGER, P. (2002). Animal Liberation. New York: Harper Collins.

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## **Declaration**

I declare that I have worked on my bachelor thesis titled "Ethical issues in intensive factory farming" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break any copyrights.

In Prague on 14.03.2021

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## **Acknowledgement**

I would like to thank my supervisor Daniel Rosenhaft Swain and my mother for their constant support and advices.

# **Ethical issues in intensive factory farming.**

## **Abstract**

In response to an ever-growing demand for meat, its production has increased too. Industrial animal farming provides us with plenty of affordable meat product due to high efficiency of the production. However, intensive factory farming brings up some ethical questions regarding its production methods. This thesis investigates ethical issues and some of the consequences of modern factory livestock farming. In the thesis, I make connections between term “animal welfare” and various ethical issues noted in industrial animal farming. Also, I wanted to research if these ethical issues are acknowledged by general public, the government. That is why I conducted a survey and asked young people questions regarding meat production and meat-eating habits. Regarding the government, I researched how exactly governments deal with ethical issues listed in my thesis. Moreover, I introduce some of the alternative ways of producing meat and meat-like products, and research whether young consumers would be ready for consuming them.

**Keywords:** animal welfare, factory farming, environment, food safety, meat, consumer choice, agriculture

# Etické otázky v intenzivním továrním zemědělství.

## Abstrakt

V reakci na stále rostoucí poptávku po masu se zvýšila i jeho produkce. Průmyslový chov zvířat nám díky vysoké efektivitě výroby poskytuje spoustu cenově dostupných masných výrobků. Intenzivní tovární zemědělství však přináší určité etické problémy týkající se výrobních metod. Tato práce zkoumá etické problémy a důsledky moderního chovu hospodářských zvířat. V práci se věnuji souvislostem mezi pojmem “dobré životní podmínky zvířat” a různými etickými otázkami, které se vyskytují v průmyslovém chovu zvířat. Také jsem chtěla prozkoumat, zda tyto etické problémy uznává široká veřejnost, vláda. Proto jsem provedla průzkum a položila mladým lidem otázky týkající se produkce masa a stravovacích návyků. Pokud jde o vládu, zkoumal jsem, jak přesně vlády řeší etické problémy uvedené v mé diplomové práci. Kromě toho představuji některé alternativní způsoby výroby masa a masných výrobků a zkoumám, zda by mladí spotřebitelé přistoupili k jejich konzumaci.

**Klíčová slova:** dobré životní podmínky zvířat, Velkochovy, Prostředí, Bezpečnost potravin, Maso, výběr spotřebitelů, zemědělství

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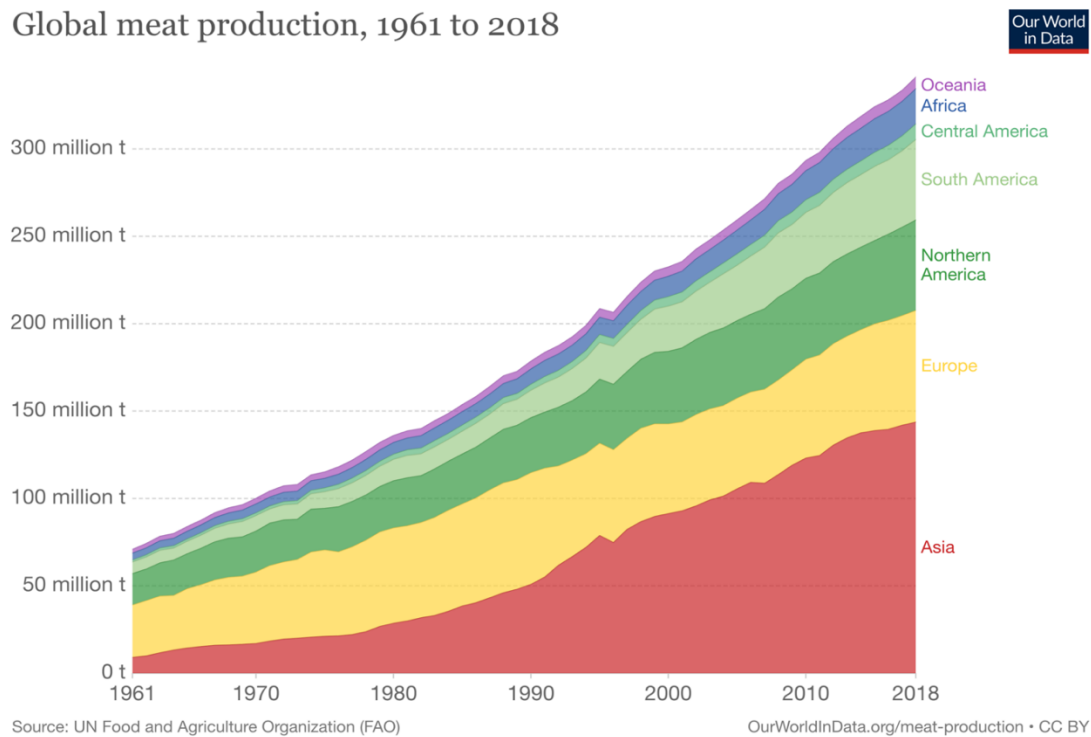
# 1 Introduction

## 1.1 Intensive livestock production: animal welfare and other detriments of factory farming.

At first sight, highly efficient and low-cost livestock farming provides us with affordable dairy products. Buying meat, milk products, or eggs is not a privilege but an essential part of our diet and everyday life. Despite the advantages of meat being an easily accessible resource, factory farming arouses massive public concerns, and protest movements around the globe. Are more people concerned whether our meal comes from a factory or not? Should we personally contemplate if it is morally acceptable to treat animals that way? Mostly, people argue about an ethical side of a system and debate if animals possess some rights just like us. There are also raising concerns about the impact that factories have on the environment and our health. Is modern meat, in fact, that nutrient and safe? In this bachelor thesis, apart from exploring ethical theories about animal welfare, I will also reflect on reasons for increasing public concerns and explain what consequences and effects intensive farming has directly on animals, on us - the consumers, and on our planet.

Livestock farming is a vital part of the national economy and it contributes significantly to the country's food supply, its GDP. Traditional agriculture, for example in the USA, was a sphere with a huge human-labor involvement. More than twenty-four percent of Americans were involved in farming. After WWII, agriculture has faced rapid economic growth and a fast-paced increase in population which uncompromisingly led to a rise in demand for dairy products and meat. To meet ever-rising animal products demand, the agriculture industry has adapted, and nowadays it is mostly based on an intensive farming system. As a result, meat production volume has increased significantly. Such a production trend, as I said before, is a response to an ever-growing demand for dairy products, especially for cheaper ones. According to the FAO (Food and Agriculture Organization of the United Nations), global demand for meat products has doubled in period 1988-2018 and increased four-fold from 1961 to 2018, which respectively, led to an intensification of animal farming. On the following chart, we can see how dramatic a rise in meat production was during the 1961-2018 period.

## Global meat production, 1961 to 2018



**Figure 1. Global meat production, 1961-2018**

As we can see on the graph, the increase in a food production over the globe is enormous. For Europe, meat production in the period of 1961-2018 has doubled from 30 million tones to 63 million. At the same time, Asia has increased its meat production from more than 9 million tons to almost 144 million tons, Africa – from 4 to 20 million tons, Oceania – from 2,3 to 6,7 million tons, America in total – from 25,7 million to 106 million tons.

Such a rapid growth in meat production and consumption can be explained by several factors, such as wealth, livestock production efficiency. According to numerous statistical researches concerning global meat consumption, the most exponential factor of its increase is a country's economic development.

Intensification is also closely tied with mechanization. Therefore, because of that and some other factors, e.g., difficulty of the job, low salary, only 1,5 percent of Americans are involved in a farming industry. (Overcash, 2011)

Intensive or „factory” farming refers to a farming system where large groups of livestock are crowded in confined spaces such as cages and stalls. According to (Sentience Institute, 2019), 99 percent of farmed animals are coming from factory farms. This share includes “70.4% of

cows, 98.3 percent of pigs, 99.8 percent of turkeys, 98.2 percent of chickens raised for eggs, and over 99,9 percent of chickens raised for meat” (Sentience Institute, 2019)

Such type of farming system aims to grow animals in the most quick, cheap and efficient way possible. Improvements listed below have contributed a lot to an increased efficiency of production. Nowadays, it takes much less time to raise a grown animal, e.g., it took approximately 16 weeks for a chicken to reach 1 kg of weight and now only 7 weeks are needed for a chicken to reach the weight of 2,3 kg. (Pew Commission on Industrial Animal Farm Production, 2009)

Generally, ways of achieving such high effectiveness in a factory farming involves:

- Concentrated animal confinement in cages.
- Usage of hormones to increase the production. (is used all over the world except the EU, where it is illegal)
- Usage of antibiotics to prevent the diseases that are easily spread in such tight conditions.
- Selective breeding of animals for faster growing.

In this bachelor thesis, I will also explain more thoroughly, how industrial farms operate and what is understood by term CAFO.

## **2 Objectives and Methodology**

### **2.1 Objectives**

The main objective of the theoretical part is to research ethical problems existing in industrial livestock farming, to find out what impact does it have on people in general, on the consumers, on the environment. I will also research what are modern conditions of “animal welfare” and how ethical treatment of animals is connected to all these ethical questions. Moreover, it is vital to know why animal welfare in terms of factory farming is being acknowledged more and more by general public and to research if people’ perception regarding the topic and the reality match, if they make deliberate choices when buying meat. Because I research industrial animal farming, I will also give information about how industrial farms operate, what are the standard sizes of such factories and how are animals treated there. In the last part of my thesis, I will explain how these ethical issues are acknowledged by the government and the producers, how governments make regulations to decrease impacts of factory farming, what alternatives are proposed nowadays.

The main goal of the practical part is to research young people’ attitude towards different types of meat, their habits in terms of meat-eating, their knowledge about ethics of factory farming. Also, I want to discover if young consumers are susceptible towards alternatives and new information in terms of meat-eating.

### **2.2 Methodology**

The theoretical part is done through discovering literature and scientific researches related to the thesis topic. I have explored modern philosophical authors who contributed to defining what is animal welfare. Moreover, I studied some scientific papers regarding signs of pain in animals as it is one of the factors of animals acquiring this “welfare”. I have conducted research regarding factory farming – how it appeared, how it is organized nowadays, what consequences these factories bring.

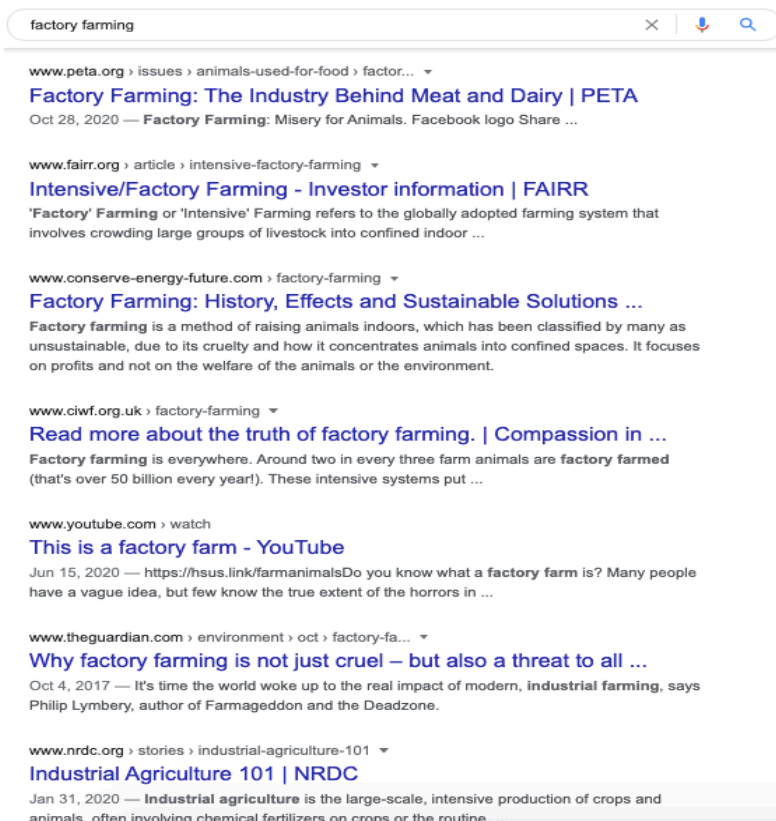
The practical part is done by questioning young people from Russia and Europe. In the survey, I explored what habits do young people have in terms of meat-eating, what attitude and knowledge they have about factory farming, if they know about the existing alternatives and would be ready or eager to try them. My own research is done through the survey, statistical interpretation, and conducted conclusion from the data.

## 3 Literature Review

### 3.1 Why is ethics of intensive agriculture questionable now?

Back before, there was not much information about how intensive farm operated. Era of internet has provided us with a plenty of information about how factories work and what methods are used in intensive animal slaughtering. People perception towards factory farming is highly influenced by the information they receive about it. Most of the time, various information sources show negative sides of intensive farming, pushing consumers to doubt whether conventional meat is really a best choice for them. However, the negative presentation of intensive factory farming in media is often based on contemporary ethical issues in industrial farming that I describe in the next parts of my paper. These ethical issues are based on real researches, and nowadays they are easily accessible for general public.

To prove that intensive animal farming is mostly represented as a worrying and antipathetic industry, I looked up “factory farming” in multiple search services. To avoid personal preferences filters in results, I used anonymous mode in the browser. The results can be seen below.



factory farming "factory farming"



### People also ask

- Why factory farming is bad? ▾
- What percentage of farming is factory farming? ▾
- Where is factory farming most common? ▾
- What causes factory farming? ▾
- How can I stop factory farming? ▾
- Who benefits from factory farming? ▾
- How are animals killed in factory farms? ▾
- How are animals treated in factory farms? ▾
- Does factory farming affect environment? ▾
- How common is factory farming? ▾
- Why is animal farming bad? ▾
- What really happens in factory farms? ▾
- How many cows are in a factory farm? ▾
- How do you avoid factory farmed meat? ▾
- Is factory farming cruel? ▾
- How many animals are killed in factory farms each year? ▾
- Is factory farmed meat unhealthy? ▾
- How much of our meat comes from factory farms? ▾

[Feedback](#)

As we can see from frequently asked questions and most relevant “factory farming” search results, factory farming is presented rather negatively: as an unsustainable, cruel, unfair, unhealthy process. Although, factory farming is shown negatively, it does not necessarily say that factory farming is a negative process. To find out whether perception and reality match, in the next sections of my thesis, I explain the conditions connected with factory farming.

To find out themselves, consumers can ask questions to find information that can either confirm or refute their viewpoint. The first answer one gets by searching “factory farming” gives us perception that factory farming is unhealthy and unethical method of raising food:



“Factory farming is an unsustainable method of raising food animals that concentrates large numbers of animals into confined spaces. Factory farms are not compatible with a safe and wholesome food supply” (Food & Water Watch, 2021)

That is also confirmed by a little information provided by producers – product is considered to be made in a not pleasant way but, nevertheless, it is affordable.

Here are some extracts from interview with Bill Haw, CEO of Kansas City's National Farms (meat packing company). He describes the slaughterhouse that way:

“Well, the slaughterhouse is not a pretty thing. I mean, it's a necessary process. It's a highly efficient process. But it's not now, nor never will be, a very pretty thing. Animals come there to die, to be eviscerated, to be decapitated, to be de-hided -- and all of those are violent, bloody, and difficult things to watch. So, your first and foremost impression of at least the initial stages of the packing house are a very violent, very dehumanizing sort of thing.”

(Haw)

When asked of a goal of a huge feedlot, he also confirms what I have said before:

“The goal of the feedlot is really at least twofold. One, it's to increase the efficiency with which the animal goes from 700 or 800 pounds to 1200 or 1300 pounds -- not only the speed with which they attain that weight, but the efficiency, the cost efficiency.

And the other role is to increase the palatability of the product, because an animal that's finished on a high-energy ration is much more tender, much more flavorful, more juicy, and much more in keeping with the American taste.”

(Haw)

Despite the fact that negative information is nowadays prevailing in the media, public perception and the reality of factory farming usually do not match. For example, people's concerns about infection risks connected to livestock husbandry are often exaggerated or inaccurate. For example, total disease and death cases of Avian Influenza are not high. But the projection of the epidemic in medias and government efforts to fight the disease were dramatic, for example in the UK and in Netherlands. The financial losses due to influenza A outbreak in 2003 approximated to be hundreds of millions of euros, and a lot of animals were killed – including healthy ones. Such outbreaks tend to cause high concerns and panic by public. (Kimman, et al., 2013)

In comparison, concerns about common infections associated with food, such as salmonellosis are somewhat less perceptible. But these infections have a significant and constant effect on public health. In 2017, EU members have registered 92 649 cases of Salmonella. It is the most common gastrointestinal infection, and its outcomes are mostly linked to eggs. (European Centre for Disease Prevention and Control., 2020) Absence of systematical informing on hygiene rules, and confined production vulnerable for infections – all contribute to a raising number of the cases. (European Centre for Disease Prevention and Control, 2017) But such information does not appear massively among the medias and public concerns are lower.

Numerous animal rights organizations that work through protest campaigns, educational posts in social medias, involvement of celebrities, are making animal protection a trend and new fashion – also in terms of eating. However, often, such information resources tend to manipulate people and their emotions – for example with flashy headlines (from a website called Sentient Media).

[sentientmedia.org](http://sentientmedia.org) › [factory-fa...](#) ▼ [Перевести эту страницу](#)

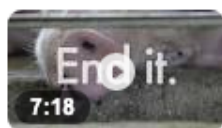
## Factory Farming: The Horrifying Secrets Behind the Scenes

Figure 2. Headline of an article about factory farming.

Another way of magnifying people’ attitude is to show “undercover” videos from factory farms. Most of them are recorded and uploaded by animal rights organizations. Moreover, some undercover videos were investigated and proven to be a set-up. (Center for Consumer Freedom, 2015)

[www.worldanimalprotection.org](http://www.worldanimalprotection.org) › ... · [Перевести эту страницу](#)

## End factory farming | World Animal Protection



Main menu - International · **Factory farming** is animal cruelty. We must end it. Help us protect the 50 billion ...

2 мар. 2020 г. · Добавлено пользователем World Animal Protection

[www.peta.org](http://www.peta.org) › Videos · [Перевести эту страницу](#)

## Factory Farming in 60 Seconds Flat | PETA



Go behind the scenes of the meat, dairy, and egg industries, all in just one minute.

12 сент. 2012 г. · Добавлено пользователем Elizabeth O'Mara

Figure 3. Undercover videos about factory farming.

Veganism, healthy nutrition, cruelty-free, organic and plant-based food are slowly taking over the social networks and other medias. Environmental and animal protection organizations, electronic media - all have contributed to making ethical consumerism a trend and raising awareness in the food choices.

Considering everything above, modern industrial meat agriculture is under a massive attack of animal rights organizations. However, that also often leads to numerous misconceptions. Because of the lack of knowledge about the process, impact of industrial farming, young people can have misconceptions about the meat processing. They may not know the real impacts of factory farming or acquire a full-fledged own opinion about conventional meat. And factory farms do not become more opened and straightforward to customers, they do not show the real conditions in farms themselves, and these misconceptions happen because of the lack of clear and true information regarding industrial livestock farming. The main issue is not how people perceive it, but the reason why factory farming is perceived that way. In order to avoid misleads, food and health education should become more widespread and easily understandable. And factory farms should take part in that too – by honest communication with customers. But to be honest with consumers and not to scare them off, factories can show their realities after improving the farming conditions for animal welfare, the impact on environment, human health. That will not only lead to positive improvements in spheres said above, but also will increase brand empathy and trust among the customers.

### 3.2 **Animal welfare defined**

To explain why modern consumers are bothered with issues of animal welfare, it is firstly necessary to explain the definition itself.

Review of philosophical literature is not the main focus of this bachelor thesis; however, it is useful to be explored at least partly because such theories have contributed to acknowledging arguments to support animal rights and welfare ideas.

Shortly, I will explain contemporary views regarding animal welfare and animal rights, modern literature that pushed these ideas to the masses.

“**Animal welfare** denotes the desire to prevent unnecessary animal suffering (that is, whilst not categorically opposed to the use of animals, wanting to ensure a good quality of life and humane death)”.

“**Animal rights** denote the philosophical belief that animals should have rights, including the right to live their lives free of human intervention (and ultimate death at the hands of humans).

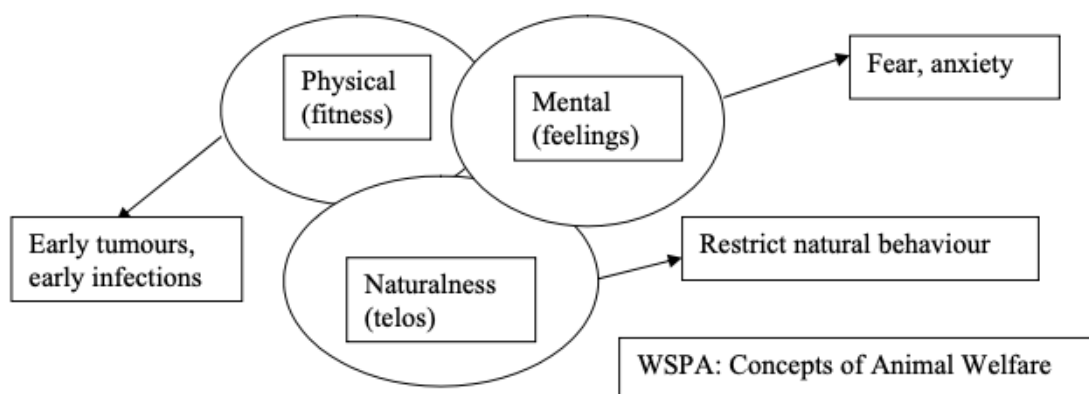
Animal rightists are philosophically opposed to the use of animals by humans (although some accept ‘symbiotic’ relationships, such as companion animal ownership)”. (Cox, et al.)

Animal liberationists (e.g., most influential authors Singer and Regan) are the opinion that animals should remain free from any form of exploitation, while from animal welfare believer viewpoint, it is morally accepted to use animals when their welfare is assured and provided. From most recent animal welfarists perspective, the essential idea of animal welfare is that a livestock should be provided with life free from avoidable suffering, and that all the purposes for which animals are commodified should be critically and morally evaluated.

(Cox, et al.)

Peter Singer had an enormous influence on contemporary animal’s usage, consumers attitude towards meat eating and increased public awareness of modern animal commodification with his book “Animal Liberation”. In the book, he explores ethics of animal treatment and explains so-called principle of equal interests’ consideration. Main purpose of the principle is, during any action, to take in account interests of animals as much as of people. “*The essence of the Principle of Equal Consideration of Interests is that we give equal weight in our moral deliberations to the like interests of all those affected by our actions*” (Singer, 1993)

Argumentation is simple: animals do not have the same particular interest in continuing their existense like people do. Thus, killing an animal does not violate it’s interests. The interest that animals have, though, is an interest in avoiding pain. That conclusion comes from a proved scientific fact that all vertebrates are capable of experiencing pain and understanding it. (National Research Council (US) Committee on Recognition and Alleviation of Pain in Laboratory Animals., 2009)



**Figure 4. Concepts of animal welfare**

Source: WSPA

Nevertheless, concrete definition of animal welfare is nowadays constantly debated and aims to be modified. However, three states that define welfare are proposed by WSPA (World Society for the Protection of Animals) and are internationally recognized. Three modern dimensions of animal welfare are:

- 1) Physical (fitness) – includes acceptable feeding, thermal comfort, absence of pain and injuries.
- 2) Mental (feelings) – absence of stress, fear of pain, presence of positive emotions
- 3) Naturalness (telos) – possibility to express natural behavior (e.g., roaming around, herding and socializing, sleeping)

### **3.3 Identifying pain and sentience in dairy cattle**

One of the most important reasons why factory farming ethics is put to a doubt, is animal sentience, and their ability to feel pain, stress. As I have contrasted above, according to Singer, the treatment of animal would be “ethical” if the principle of equal interests consideration is respected. The main interest of animals is to avoid pain. And by putting animals in conditions where they have a chance to experience pain would be considered unethical. Among the general audience, Public concern about animal welfare and pain is growing among the consumers and farmers. (Determinants of consumer intention to purchase animal-friendly milk, 2016). General public tends to worry more about the conditions in which livestock is raised, if animal whose meat they are buying suffered or not. The problem of animal’s pain among the producers is sometimes ignored, because they do not necessarily realize that animals can feel pain, or they cannot recognize signs that it is truly a pain that animal is experiencing.

Animals do not communicate verbally, that is why identifying pain among livestock is a matter of attention, structured work and it is done through their behavior. Cattle are often described as stoic animals, meaning they do not show easily recognizable signs of pain. Nevertheless, numerous veterinarian research papers in behavior of other animals that are assumed to be stoic, for example horses (Costa, et al., 2014), (Gleerup, et al., 2015), mice (Langford, et al., 2010), rats (Sotocinal, et al., 2011) and rabbits (Keating, et al., 2012), have proved that subtle behavior changes are related to pain and can predict it.

To identify possible pain-related actions in term of dairy cattle (in this study – cows), universities of Denmark and Sweden with authors K.B. Gleerup et. al. conducted a veterinarian research to prove that livestock is able to experience, identify pain and express it behaviorally.

Potential signs of pain were studied for dairy cattle, with the goal to conduct a pain scale under production conditions and to provide farmers, meat factories with this scale. Forty-three cows were selected, and, under clinical examination, several behavior signs were identified.















All the cows were divided into two groups: a group treated with placebo – saline, and a group treated with commonly used cattle analgesic – Ketoprofen. After the treatment, cows were marked and put back in the herd (production farm conditions) Cows behavior was scored before and after the treatment. Well-recognized signs of a strong pain, such as tooth grinding, vocalization, head pressing or kicking toward the belly are not included in the scale, but these should be always considered attentively when owning a cow. (Gleerup, et al., 2015)

Less obvious pain behaviors, which are often overlooked, are compounded into a pain scale – a result of the whole research and veterinarian examination. The pain scale consists of seven different behaviors, rated from zero to two. The pain scale is intended for proving that livestock does feel pain, especially in factory farming conditions, and for evaluating the pain in farm cows in order to reduce it when needed.

Seven types of reactions to pain are:

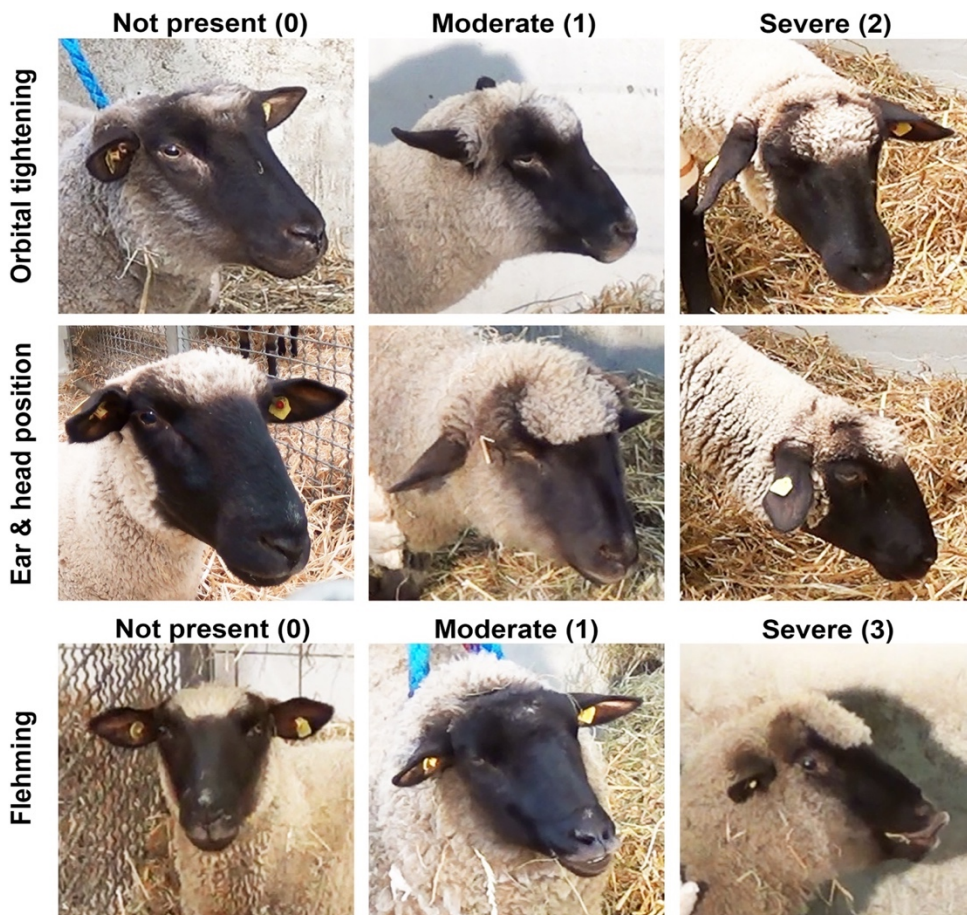
- 1) **Attention towards the environment.** When in pain, cow tends to lose its focus on the surroundings, on people who are approaching it.
- 2) **Head position.** While experiencing pain, cow often results in lowering its head. This reaction can be explained in two ways: changed posture to more comfortable one, or an attempt to avoid social interactions.
- 3) **Ear position.** Cow that feels pain can be also recognized by its ears – kept straight and backwards, or very low.
- 4) **Facial expression.** The cow changes its face expression to tense when in pain.
- 5) **Response to approach.** A cow in pain will be less attentive to people approaching her in aim to avoid any social interactions.
- 6) **Back position.** When pain is felt in legs or abdomen, a cow tends to arch her back unnaturally.

7) **Lameness.** It is a consequence of pain in one or more limbs. When pain is in more than one limb, cow results in walking very carefully and slowly.

Score	0	1	2
Attention towards the surroundings	Active and attentive 	Not attentive 	
Head position	Head held high 	Lower than withers 	Very low 
Ear position	Both ears forward or actively moving 	Both ears back 	Lamb's ears (low ears) 
Facial expression	Attentive or neutral look 	Tense expression 	
Response to approach	Look at observer, head up, ears forward or occupied with activity (grooming, ruminating)	Look at observer, ears <i>not</i> forward, leave when approached	May/may not look at observer, head low, ears <i>not</i> forward and may leave slowly
Back position	Straight line 	Slightly arched back 	Arched back 
Lameness	Not lame Normal and rhythmic strides	Lame Shorter and non-rhythmic strides	Very lame No support on one leg or very unequal and short

**Figure 5. The Cow Pain Scale. (Gleerup, et al., 2015)**

Also, similar research was conducted with sheep, and several responses to pain were found. (Häger, et al., 2017) (Orbital tightening, lowered head and ear position, flehmen response – inhaling with opened mouth and curled upper lip. (Merriam-Webster)



**Figure 6. Action units of the Sheep Grimace Scale (SGS)**  
Source: (Häger, et al., 2017)

Concluding everything said above, we can state that animals are subjected to pain, they can recognize it and give an immediate behavioral response to it, such as abnormal postures, tense facial expressions, licking their injured area and other signals. Pain is a significant welfare problem that needs to be taken care of to meet buyers' requests in future, as painful treatment worries more and more consumers. (Determinants of consumer intention to purchase animal-friendly milk, 2016) Ways of reducing pain include in-time pain treatment, prevention of painful procedures and immediate intervention when signs of pain are seen. Nowadays it has become much easier, as modern technologies make it possible to observe animals and to recognize their pain signs. Moreover, global tendency in terms of pain management is positive. New legislative acts across the world take their part in reducing pain among factories, for example by making legally compulsory use of analgesia. However, I will talk more about such legislative acts in the last sections of my paper.



### 3.4 Factory farming

Considering welfarists ideas and researches about animal sentience, we can now figure what conditions are meant by term “welfare” and state that animals, indeed, are conscious and they can feel pain.

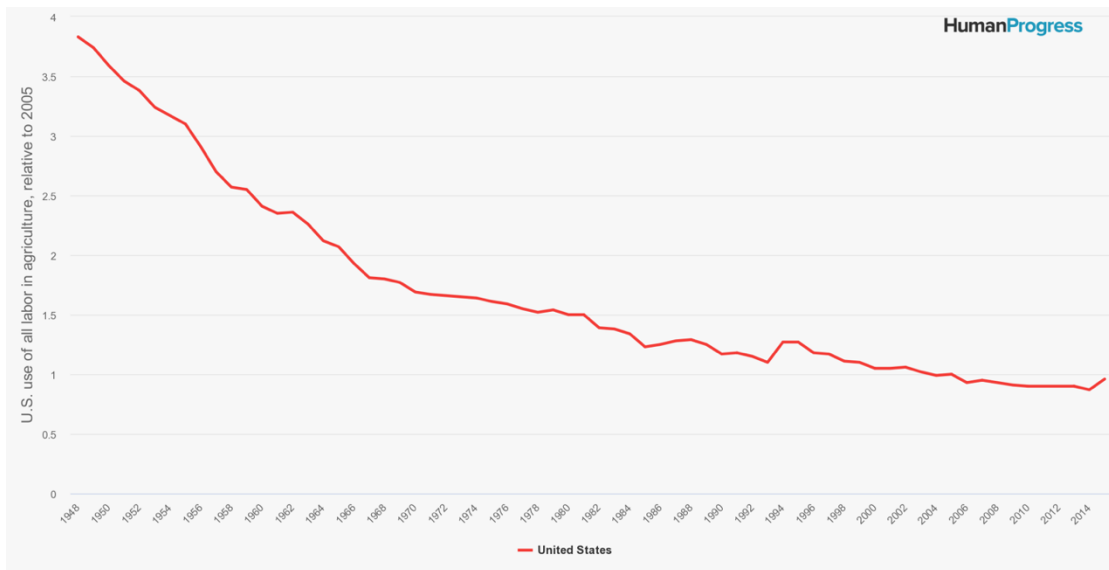
Aside from theories and researches regarding animal position, views among the regular people, e.g., consumers, vary. Undeniably, now people tend to be more concerned about what are the origins of the meat they are buying, how is it processed, how animals are treated at the factories, is it healthy. We can state that consumer awareness in terms of eating increases. But do people projections about factory farming and reality match? In the next chapters, I want to research, **what ethical issues in factory farming there are now, what is the definition of industrial farming/CAFO, how are they regulated by the government?** Also, it is vital to research the history of factory farming, how and when was it formed.

#### 3.4.1 Farming intensification as a post-war policy

Back in the beginning of 20<sup>th</sup> century, worldwide agriculture was mostly formed by small and medium-sized farms. Farm animals were functioning with the help of traditional hired-labor methods and by practicing animal traction, for example by using horses for livestock transportation (Animal traction - animal powered mechanization, use of animals to pull farm equipment, vehicles, and other loads) (Peace Corps Volunteers). Farm animals were occupying large areas and could move freely, no hormones or fertilizers were used, and numerous farms in general, were a small family business rather than a scale industry. However, Second World War and its consequences have brought significant changes to the overall agriculture and farming methods, and then organized them the way we are used to it nowadays. The main actors and contributors to such changes were countries that acquired the largest share in global animal production and relied heavily on it, such as The United States, Canada.

The key factors that influenced farming intensification were the aftereffects of the Second World War. The end of the war was led by a technological revolution. To fight hunger and satisfy highly increased food demand, restore exports and industrial infrastructure, farming was transforming to an efficient, mechanized business. New farming methods which include chemical use, mass implantation of confinement systems and innovational machineries were considered the first agents of turning agriculture into an industry that we are used to nowadays.

Firstly, to improve efficiency of the farming system, production methods were changed. Human, as well as animal labor was an expensive and hardly accessible resource, especially in post-war period. Tractors and other machines, on the other side, were cheaper and more effective. Consequently, farms were becoming less dependent on animal traction or hired labor and relied more on technics. Mechanization was one of the reasons why less percentage of people were employed in agriculture sector.

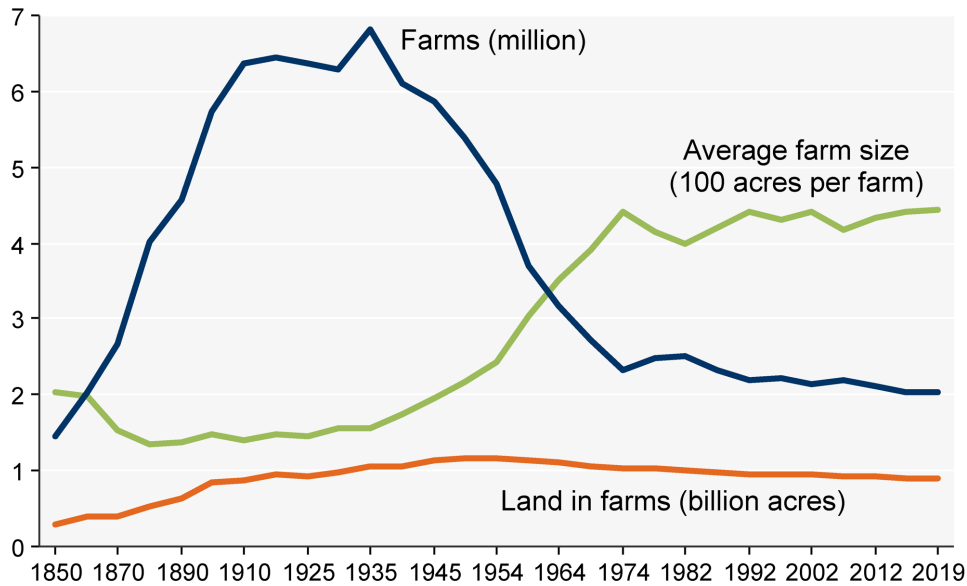


**Figure 7. U.S. use of all labor in agriculture 1948-2014**  
(U.S. Department of Agriculture, Economic Research Service on Agricultural Productivity in the U.S.)

Statistical data above shows how rapidly evolving was the dynamic of farming mechanization in the U.S. Labor inputs between 1948-1960 have decreased by 35%. Human and animal labor were no longer preferable by a farmer. Second key element that intensified animal production was an introduction of new animal confinement systems. So-called CAFOs (Concentrated Animal Feeding Operations), which structure was explained in the introduction, started to spread across the world and replace small farms in the mid 1930s. Less space was given for a rising number of animals, farms started to increase their total livestock number and the actual farm size. However, land in farms remained almost unchanged and relatively small through the whole period of 1850-2019. Tight livestock confinement started taking its place in the farming industry. At the graph below, we can clearly see that number of farms were at their peak in 1935 and started to fall sharply until 1970s. Ever since, number of U.S. farms are still declining, but more steadily. Changes in land in farms are mostly insignificant. The latest data states that

there are less farms in 2019 (2,02 million) comparing to year 2007 (2,20 million) (USDA, National Agricultural Statistics Service, 2020)

Million farms, billion acres, or 100 acres per farm



**Figure 8. Farms, land in farms, and average acres per farm, 1850-2019**  
(USDA, National Agricultural Statistics Service, 2020)

The War and its aftermath have provoked dramatic shortage in goods, mostly edibles. Resource, that remained plentifully though, was ammonium nitrate. The chemical compound was used widely among the US military as a gunpowder element and as an “insecticide”, or so called “insect killer”. In the post-war USA, military investments and total chemicals surplus were so enormous that getting rid of them was thought highly incentive. Therefore, manufacturers and the government considered this situation as an opportunity to gain money by selling chemicals to the farm workers. Farmers, on the other side, struggled fiercely with post-war labor shortage and pests destroying the crops, that were making it almost impossible to support the livestock existence, not to mention feeding themselves. Any attempts to maintain a satisfactory crop yield without the additional technologies or any sufficient manpower were doomed to failure. Subsequently, chemical fertilizers that were able to fight insects have been met with great success. The first herbicide called 2,4-D (2,4-dichlorophenoxyacetic acid) was released in 1945. Next year, its sells volume overcame 630,000 pounds level, and in 1947, factories sold 5,315,000 pounds, a 500 percent selling increase. (The Ganzel Group Communications, Inc.) Use of chemicals for meat production was another step towards making farm a factory.

### 3.4.2 What is an industrial farm/CAFO now?

Nowadays, livestock production is shifted from extensive animal production to an intensive one as businesses tend to replace hired labor and natural production methods with technologies. The main difference between two types of farming is that extensive agriculture requires more land for profitability, is dependent on soil fertility, availability of water and often, its profit changes according to the weather and climate conditions. Industrial farming is using indoors raising technologies and is mainly represented by only a few so-called CAFOs. (Concentrated Animal Feeding Operation) The term originates from the USA, where definition of what is considered a CAFO was created in 1976. CAFO is a term applicable specifically to the USA, because there it is considered a significant contributor of pollutants, and special regulations are applied on them. Europe does not have this name division; however, main production principle – efficiency stays the same. Such type of farming system aims to grow animals in the most quick, cheap and efficient way possible. CAFOs way of doing it is by keeping large number of livestock in crowded confined spaces with no ability for them to properly move or defecate. Farms with such confinement systems reduce their total costs by minimizing the livestock/production area ratio. Generally, the current trend of production is to grow more livestock in smaller spaces, use cost-efficient feed and replace hired staff with technology as much as possible.

Consequently, factories gather living and dead animals, their food as well as all the production leftovers on a small functioning area, where all mentioned components reside tight to each other. The actual size of CAFOs varies from one thousand to tens of thousands animal units, and such systems have the biggest share of total produced meat products in the U.S.

Animal Sector	Size Thresholds (number of animals)		
	Large CAFOs	Medium CAFOs <sup>1</sup>	Small CAFOs <sup>2</sup>
cattle or cow/calf pairs	1,000 or more	300 - 999	less than 300
mature dairy cattle	700 or more	200 - 699	less than 200
veal calves	1,000 or more	300 - 999	less than 300
swine (weighing over 55 pounds)	2,500 or more	750 - 2,499	less than 750
swine (weighing less than 55 pounds)	10,000 or more	3,000 - 9,999	less than 3,000
horses	500 or more	150 - 499	less than 150
sheep or lambs	10,000 or more	3,000 - 9,999	less than 3,000
turkeys	55,000 or more	16,500 - 54,999	less than 16,500
laying hens or broilers (liquid manure handling systems)	30,000 or more	9,000 - 29,999	less than 9,000
chickens other than laying hens (other than a liquid manure handling systems)	125,000 or more	37,500 - 124,999	less than 37,500
laying hens (other than a liquid manure handling systems)	82,000 or more	25,000 - 81,999	less than 25,000
ducks (other than a liquid manure handling systems)	30,000 or more	10,000 - 29,999	less than 10,000
ducks (liquid manure handling systems)	5,000 or more	1,500 - 4,999	less than 1,500

<sup>1</sup>Must also meet one of two "method of discharge" criteria to be defined as a CAFO or may be designated.

<sup>2</sup> Never a CAFO by regulatory definition, but may be designated as a CAFO on a case-by-case basis.

**Table 1. Regulatory Definitions of Large CAFOs, Medium CAFO, and Small CAFOs**  
(United States Environmental Protection Agency, 2003)

### What ethical issues in factory farming are there now?

Second question that I wanted to answer – what real issues are in industrial farming now?

The most prevalent ethical issues noted by public are:

- **Livestock treatment.** It is believed that animals are in pain and treated poorly at the factories.
- **Environmental impacts.** Factory farming is proven to be an unsustainable process, and it is considered one of the biggest contributors to deforestation, water and air pollution.

- **Working conditions in factory farms.** Labor conditions are widely criticized, reckoned exploitive and highly dangerous.
- **Widespread chemical use.** Use of chemicals to resist pests, antibiotics for diseases control and hormones to increase the production do not only bring damage to animals but can also harm people.
- **Food safety and impact on health.** Some widespread facts among public are that meat processed at factories is often exposed to contamination, and that factory conditions are unhygienic. Moreover, there is also a concern about spread of diseases and the influence factory farms have on people who live in rural areas.

Let me explain each of the bullet point.

### 3.4.3 Livestock treatment at the factory farms

It was discussed already that conditions at the factory farms are tight and overcrowded. Usually, animals that are raised there have limited or even no access to the nature, which means absence of fresh air and authentic light. Moreover, factory CAFOs restrict any possibility of animals to stand, roam around the farm, extend their wings. At the factories, animals lose their ability to act naturally, instinctively. In average, medium-sized factory farm consists of 1,000 beef cattle, 700 cows, 2,500 pigs, 55,000 turkeys, 30,000 hens, or 125,000 chickens. (Table 1) With such an enormous number of animals held together in industrial conditions, it gets hard to keep the lots sterile clean. Sometimes due to close confinement and cleaning delays, animals have no choice but to stand in their own manure. That causes feet, udder diseases of a livestock, and makes it vulnerable to viruses.

Dairy production often involves painful and stressful procedures. Calves are separated from their mothers in 12 hours after being born on industrial farms. Most of the calves, primarily males are slaughtered for veal at the age of six month. Female calves are either used for meat or milk production. Calves kept for milking often have their tail docked (removal of approximately two thirds of the tail). Original goal of the painful procedure is to stop cows from swatting the flies and to prevent diseases from contacting with manure.

Pigs farmed on factories are also subject to confinement. Most of them, like cattle, are born and raised in small crates and are separated from a mother at a very young age. These conditions are highly stressful for pigs and induce them to act unusual. For example, because of confinement, fear and pain, pigs can become aggressive towards each other and bite one another, which leads to more injuries. Such phenomenon was researched, but it has only been observed in stressful factory farms conditions (e.g., limitation of instinct behavior) (Simonsen, 1990)

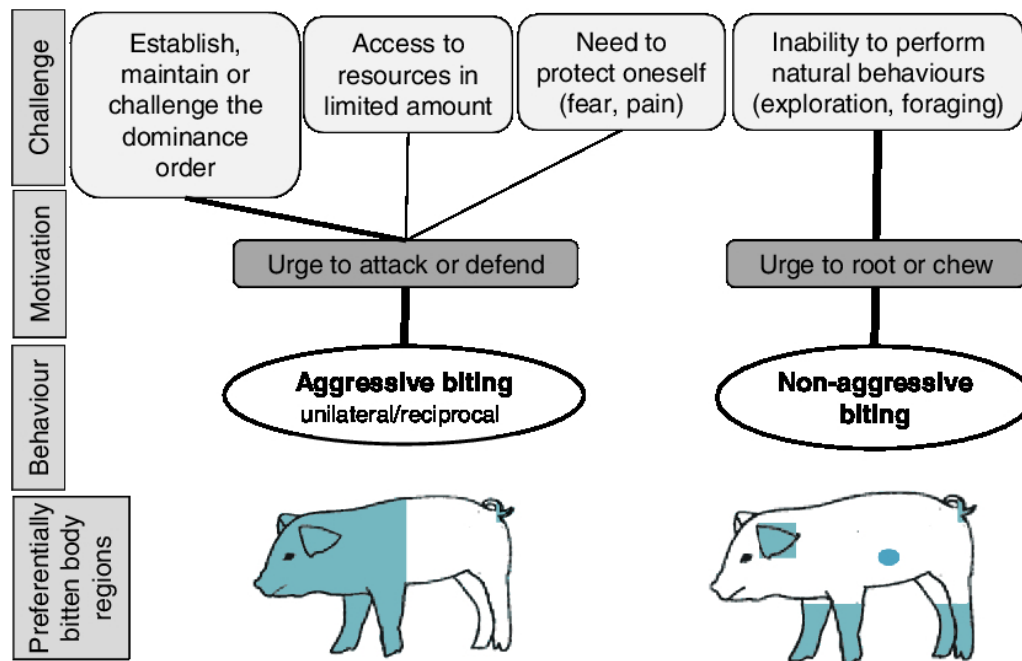


Figure 9. Targets of biting and main motivations of pigs to bite. (Prunier, et al., 2019)

Information regarding animal treatment at factories overfill internet, printed and TV sources. Reportages show farms “behind the scenes”, causing resentment among the society. Therefore, animal treatment is the most obvious and worrying ethical question in industrial farming.

### 3.4.4 Environmental impacts

One of the most acknowledged environmental damage factories bring is air pollution. The harm is done by releasing harmful pollutants in the atmosphere. The pollutants are sprayed in the air from production and animal waste. Waste products are collected in massive manure clusters and often are not properly recycled; the land on which this manure is spread are resources of the most significant air pollutants – hydrogen sulfide, ammonia, odor, greenhouse gases. (Hunt, 2015)

According to the United Nations Food and Agriculture Organization, livestock agriculture is responsible for 18% greenhouse gas emission. This fact and data above are considering animal agriculture sector of the United States.

**Carbon dioxide** is a powerful greenhouse gas which has a strong warming impact on global temperature. Animal agriculture releases CO<sub>2</sub> by:

- **High-energy feed.** Livestock at the factories is fed high-energy crops such as corn. In order to raise large amount of feed, producers use chemical fertilizers. The FAO states that fertilizers production emits approximately 41 million tons of CO<sub>2</sub> per year globally. (Steinfeld, et al., 2006)
- **Fueling animal factories.** CAFOs imply a massive use of fossil fuel-based energy to cool, heat, ventilate all the factory sections. Energy source is also meant to operate all the farms machineries, which leads to additional 90 million tons of CO<sub>2</sub> annually worldwide. (Steinfeld, et al., 2006)
- **Deforestation** in animal agriculture may release 2,4 billion tons of CO<sub>2</sub> globally. (Hunt, 2015)

**Methane.** CH<sub>4</sub> has 23 times the global warming potential of CO<sub>2</sub>. Its concentration has increased by 150% since 1750. According to the FAO, factory farming emits from 35 to 40% of anthropogenic CH<sub>4</sub>. Globally, in period 1990-2006, methane emissions from pig and dairy farming have increased by 34% and 49% respectively. The increase is associated with the shift towards confining more pigs and cows in larger facilities using manure lagoons (liquid manure management systems) (The Humane Society of the United States)

**Hydrogen sulfide (H<sub>2</sub>S) and Ammonia (NH<sub>3</sub>)** are dangerous pollutant gases, mainly associated with swine production. All the animals consume proteins in feed to produce meat, milk and eggs rich of nitrogen. The food digestion and conversion of animals to meat product is always followed by 50-80% of the nitrogen emitting in animal waste. Ammonia and hydrogen sulfide are generated in the feces and urine of pigs and cattle, and in the uric acid of poultry manure. Consequently, microbes that decompose in this waste create ammonia. Swine production has the biggest level of these emissions. (Tengman, et al., 2006)

Although low amount of ammonia occurs naturally in the environment, harmful level of the pollutant is generated during the production. According to the research maintained by RAND



and the Academy of Medical Sciences, ammonia emissions have negative effect on the environment.

Basic findings are:

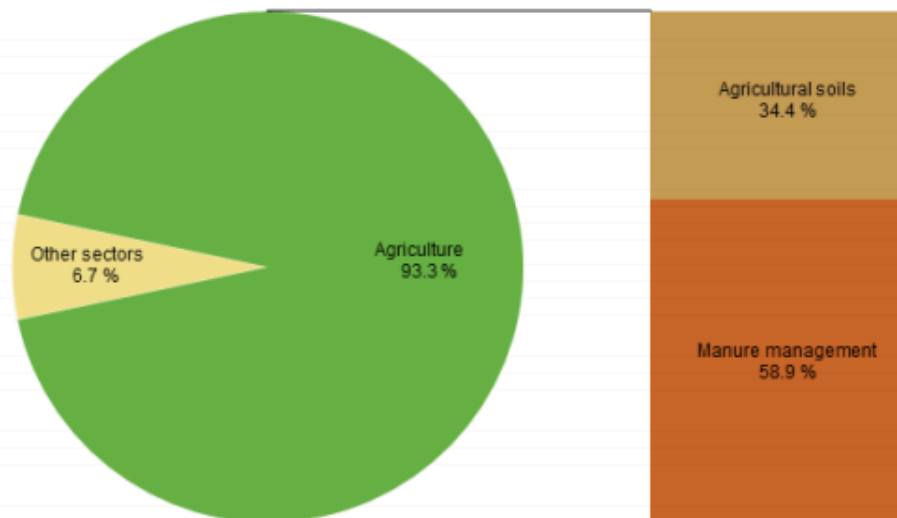
- Ammonia pollution has a direct negative effect on species through soil acidification
- Certain habitats species are extremely sensitive to ammonia pollution. For example, bog and peatland habitats are made of sensitive lichen that can be damaged even by low concentration of ammonia. Moreover, grasslands and forests are also sensible to ammonia.
- Ammonia affects freshwater through agricultural run-off and is toxic towards aquatic animals, and people who use tap water.

(RAND Corporation)

GEO (Labels)	TIME 2008	2018	CHANGE IN%
<b>European Union - 27 countries (from 2020)</b>	3 354,96	3 243,46	-3,32%
Belgium	68,43	63,46	-7,26%
Bulgaria	37,34	37,03	-0,85%
Czechia	73,32	64,77	-11,67%
Denmark	72,59	66,19	-8,81%
Germany (until 1990 former territory of the FRG)	580,70	545,88	-6,00%
Estonia	9,66	8,81	-8,80%
Ireland	106,80	118,02	10,51%
Greece	66,13	56,57	-14,45%
Spain	408,67	447,38	9,47%
France	569,01	552,32	-2,93%
Croatia	38,27	29,04	-24,11%
Italy	375,46	336,72	-10,32%
Cyprus	7,20	6,79	-5,68%
Latvia	11,39	12,57	10,40%
Lithuania	32,31	35,83	10,91%
Luxembourg	5,51	5,54	0,42%
Hungary	66,98	71,99	7,47%
Malta	1,62	1,20	-26,23%
Netherlands	116,79	106,42	-8,88%
Austria	55,07	59,22	7,54%
Poland	301,53	297,17	-1,44%
Portugal	45,15	45,09	-0,14%
Romania	179,41	156,30	-12,88%
Slovenia	17,62	17,08	-3,06%
Slovakia	28,69	27,94	-2,61%
Finland	31,38	28,74	-8,43%
Sweden	47,94	45,39	-5,32%
United Kingdom	211,58	227,06	7,31%
Iceland	5,26	5,15	-2,03%
Liechtenstein	0,22	0,20	-9,55%
Norway	30,89	30,76	-0,42%
Switzerland	54,20	50,39	-7,04%
Turkey	503,57	955,92	89,83%

Table 2. Ammonia emissions from agriculture, thousands of tons, 2008 and 2018

Source: (European Environment Agency; Eurostat, 2018)



**Figure 10. Ammonia emissions, (% of total ammonia emissions)**

Source (European Environment Agency; Eurostat, 2021)

As we can see from statistical data above, agriculture sector is the biggest contributor to ammonia emissions in the European Union. Moreover, in the USA, according to USEPA national emission inventory, CAFOs are the largest contributors to Ammonia and Hydrogen sulfide emissions. Concentration of (H<sub>2</sub>S) and (NH<sub>3</sub>) at swine factory sectors varies significantly. Emission rates depend on building architecture and manure storage structure, methods of manure management, livestock density, their average age and activity, even season, outdoor temperature and weather conditions. From the global perspective, EU has taken environmental issue seriously, it is concerned with reducing total emission level and does it with the help of new regulations and programs. Thus, from a ten-year data, we can observe a decline in the total air emissions, which is a positive trend caused mainly by improvements in the management of organic waste, decreased use of fertilizers and slight reduction of livestock number.

### 3.4.5 Working conditions in factory farms

The fight for the cheapest prices of meat is reflected not only in tight animal confinement but also in working conditions. Rapid mechanization has significantly reduced the employment of professionals in meat industry. Moreover, less and less people tend to be a professional in factory farming. Consequently, factories hire unqualified, uneducated people, often immigrants, for a cheap salary. The essential working conditions the hired staff faces are not pleasant.

Firstly, working in an animal slaughterhouse/meat factory entails stress due to fast working pace, constant smells, and noises associated with the slaughter of animals. The fact of

slaughtering itself is often a psychological trauma for many workers and leads to anxieties, PTSD (Post Traumatic Stress Disorder).

Secondly, because meat production relies mostly on migrants and uneducated labor, the salary is relatively low. Average salaries in meat industry are:

- **The United States** \$13.24 (10,99 €) / hour.  
Based on 441 ratings, 49% of Farm workers in the United States think their salaries are enough for the cost of living in their area. (Data taken from December 2020 till February 2021, according to job portal indeed.com)
- **The United Kingdom** £8.83 (10,07 €) / hour. Based on 409 salary profiles (last updated Jan 25, 2021, according to job portal payscale.com)

Thirdly, farm workers are often exposed to hazards mentioned above. (e.g., Hydrogen sulfide, odor, ammonia). Such emissions usually reach harmful concentration in a confined space. Typical NH<sub>3</sub> concentration at a factory varies from 0-40 ppm and it is usually higher at a swine production. The effects of being surrounded by NH<sub>3</sub>, to which workers are often exposed are:

Ammonia concentration (ppm)	Symptoms
10	Some negative effects at long term exposure
15	Smell threshold for human beings
20	Eye irritation for broilers
20-40	Increase of respiratory diseases
25-35	Stockmen feel uncomfortable
50	Disturbance of productive capacity; Water flows from the eyes
50-150	Decrease of young pig growth by 12- 29%
70	Reduced daily gain and poor feed conversion
100-200	Irritation and anorexia
5000	Deadly within a few minutes

**Table 3. Reaction of humans and animals to different levels of ammonia concentration.**  
(Commission Internationale du Genie Rurale, 1992)

Moreover, feeding the livestock with antibiotics ends up in microbes evolving antibiotic resistance. Workers can become sick due to constant exposure to pathogens or spread the illnesses themselves. Bacteria like salmonella, E. coli, and staph can move from confined livestock to workers and cause Methicillin-resistant Staphylococcus aureus (MRSA).

There are numerous cases of staff being injured on the workplace, hurting their hands, shoulders, backs because of the monotonous, physically hard work. Also, they are to perform dangerous tasks – to move stressed, aggressive animals in tight cages. Moving pigs is often

harmful, because as written above, they tend to bite each other and people in case of stressful situations. Thus, people get injured, infected a lot on such a workplace.

Slaughterhouse and factory workers are mostly either people without education or immigrants working for residence permit. They are constantly under risk of being fired and replaced. Therefore,

violations of rights, long-hours shifts (10-12 hours and more), dangers are either ignored by the administration or are not reported by workers to the supervisors because of the fear of losing the job.

### 3.4.6 Widespread chemical use

Use of antibiotics is still a widespread procedure. Animal agriculture is the most significant user of antibiotics for disease treatment and control, for farming productivity. Monotonous everyday use of antibiotics, in humans as well as in animals, can consequently lead to antimicrobial resistance. That is one of the reasons why antibiotic treatment in animals is increasing in its public concern. Antibiotics are used in broiler, hogs beef cattle and dairy production.

Chemicals in broiler production are used to treat sick birds or given to healthy animals to prevent the spread of diseases. There is also a tendency in injecting it into eggs and chicks to improve their viability. Moreover, until 2017 when FDA banned this practice, antibiotics were given in course of food or water to promote species growth. As antibiotics use remained untrustworthy and

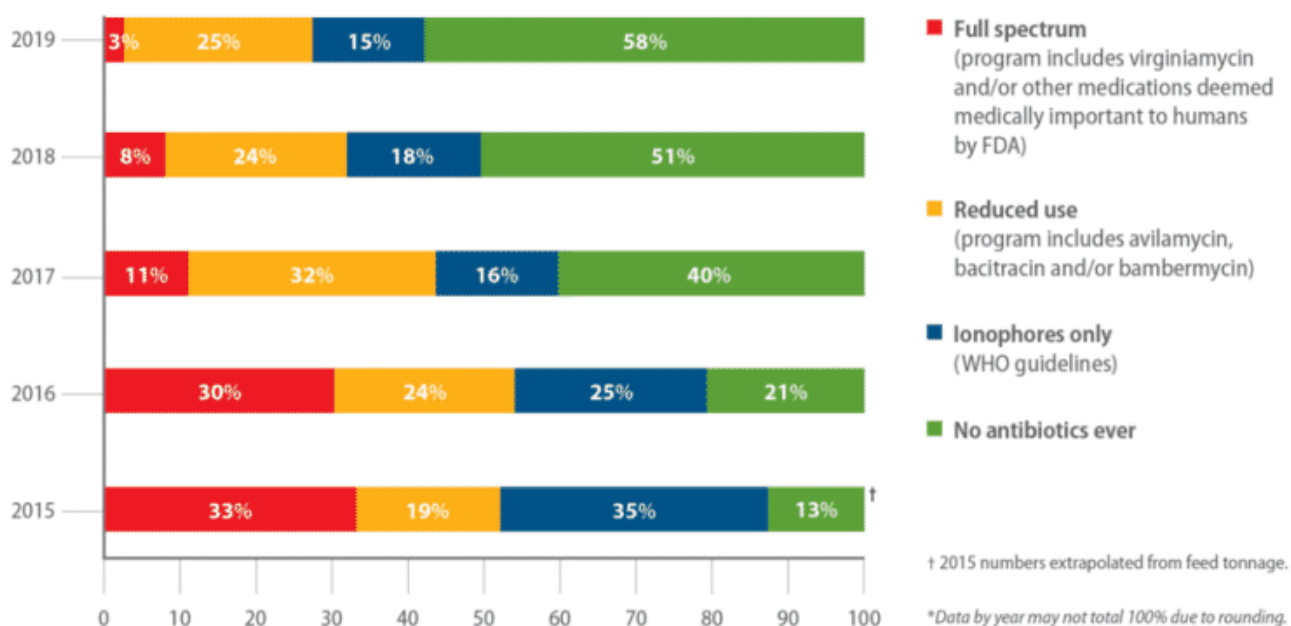


Figure 11. Percentage of US broilers by health program, 2015-2019

worrying among the consumers and new limitation acts were proposed, the percentage of broilers raised without antibiotics has increased.

“Almost six in ten US broilers were raised without antibiotics of any type in 2019”, states Greg Rennier, PhD, president of poultry-health association in the US. A growing part of broilers sold under a title “raised without antibiotics”, and flocks that got sick and used antibiotics are sold without such title.

The other chemical a person is exposed to, is dioxin. Dioxins are group of environmental pollutants, dangerous chemicals that are highly dangerous and affect organs and systems of a human. Short-term exposure of humans to dioxins may end in skin irritation, altered live function. Long-term exposure is associated with immune, nervous an endocrine systems damage. (World Health Organization). Dioxin is basically a secondary product of industrial process and more than 90% of people exposure to it is through meat and dairy products.

#### 3.4.7 Food safety and impact on health

Generally, health diseases are divided in infections and non-infectious ones. In factory farming conditions, which I have already discussed before, animals are placed in overcrowded facilities and experience some stress, for example, during transportation. Intensification of animal farming has reduced the level of contact between farmed and wild animal species. As a result, a chance for a livestock to contact with pathogens of wild animals has decreased, and thus, disease risks are decreased, too. However, more potential threats from farming intensification were found:

- 1) Increased variety of diseases and their impacts.
- 2) Immunity resistance of intensively raised livestock.
- 3) Risks of infection for free animals, and people living in rural areas (near the farms).
- 4) Risks connected with long transportation.

(Espinosa, et al., 2020)

Although intensive animal farming has reduced the entry risk of animal, (first contamination, because animals are transported and then kept indoors), it made consequences of indoor contamination worse. (higher exposure risk) As a proof, a recent research shows that intensive livestock agriculture is responsible for some cases of reassortment of avian influenza, transforming the low pathogenic virus (small or moderate risk) to a highly pathogenic virus (higher risk). (M.S, et al., 2018) There are several reasons for that phenomenon. First of all, high livestock animal density in factory farms contributes to an easier spread of pathogens

among the buildings (J.P, et al., 2008) Secondly, selective breeding, where most efficient species are chosen, is widely used in intensive farming and has resulted in a big volume of genetic similarity. The pathogens are spread easier because many genetically similar farmed animals have no pre-existing immunity to some microorganisms. (A.J, et al., 2003) Third reason for a contamination risk is the way animals are raised and transported. Stressful conditions during these procedures weaken animals' immune system and as a result, weaken their immunity and raise infection risks. (Heba, et al., 2003) Of course, these facts are known by intensive farm managers. And to reduce all the potential risks to minimum, factory farms use antibiotic drugs. These can lead to a worsened food and animal safety through:

- 1) Lowered immune system of a livestock (J.H, et al., 2017)
- 2) Appearance of resistant pathogens
- 3) Higher chances of pathogen mutation (drugs resistant)
- 4) Antimicrobials being present in the air or water system, which puts to a risk human as well as animals' lives.

As a result, that can affect the safety of meat products we eat – through bacterial contamination risk as well as a risk of food having antibiotic residues.

Another health risk associated with intensive animal production is a risk for farm workers, people and wild animals who live closely to farming facilities. As I have contrasted before, farm workers are exposed to some hazards while on the job. Also, the contamination risk comes from a ventilation, because when there is an infection, the air that comes out of the factory can bring the pathogens to the rural areas near the farm by wind.

The last health risk comes also with the problem of transportation. Products of intensive farming and livestock often are subject to exportation. In aim to find the most efficient way to export goods, the transportation cost is lowered, and the world trade of the products is increased. In 2017, more than two billion animals were transported by means of ships. (Levitt, 2020) These trips are usually held in bad conditions, and their duration lasts for a couple of weeks. (C, et al., 2020) While on these journeys, animals are also kept in confined conditions, have low immune system, constantly contact other animals and their natural waste. Long-lasting transportation of a livestock increases the risk of fast contamination. (Nardo, et al., 2011) Example of diseases spread are African Swine Fever in China (Wang, et al., 2013) and influenza A from swine production across the world. (Nelson, et al., 2015) However, the real number of fatal human cases from Avian influenza is relatively low. Therefore, it should be

considered as a potential threat and taken care of, but it should not be seen as be a mortal and life-threatening outcome of factory farming. (Kimman, et al., 2013)

#### 3.4.8 Conclusion about the ethical issues

Concluding the research about modern ethical issues in factory farming we can state that agricultural sector of livestock factory farming does not only affect animals but it is a complicated interdependent process. Generally, who is harmed by animal factory farming? As we can see, this process affects people – workers are subject to hard job and low salary, they have a contamination risk; they are harmed by chemical emissions, (e.g., ammonia) but these emissions also harm people drinking tap water or living in rural areas. Secondly, it can affect the consumers by having chemicals in the meat and dairy products (e.g., dioxins, antibiotic remains). Thirdly, it affects the environment - with the emissions of hydrogen sulfide, ammonia, odor, greenhouse gases. (Hunt, 2015) The conclusion that I came to after researching all the effects of intensive farming is that most of them are a consequence of the factory management and the way animals are treated there. For example, use of antibiotics is a consequence of animals being sick. In the section called “livestock treatment”, I contrasted that animals are subject to confinement and long transportation. In tight conditions – on the farm and during transportation – contamination risk raises as animals often stand close to each other, their manure. And to prevent sickness spreading in factory farms, antibiotics are used. Therefore, concluding everything said above, factory farming has its effects on many spheres of our everyday life – our health, the atmosphere, product quality, the environment; but the basic reason those effects appear comes from the idea of animal welfare. Reducing stress while raising animals may lead to animals being less aggressive, which means less injuries may occur – both for animals and farm workers, reducing the grain-fed diet of animals may lead to manure being less pollutive to the environment, and so on.

### 3.5 Legislation on animal welfare

In the countries across the world, the demand for meat food and their production constantly increases. Animal welfare and other spheres of influences of industrial farming gathers more and more attention, because considering issues explained above, we can state that there is a connection between animal welfare and environment or human' health. Therefore, numerous legislative acts are proposed worldwide already. The main goal of such acts is to provide sufficient meat amount and ensure welfare of the livestock and safety of food.

Animal welfare in terms of legislation is not a new concept, it has been regulated for decades in the most developed countries. In this chapter, I will explain what legal acts are proposed in these developed countries now – across the EU and the United States.

### 3.5.1 The EU legislation on animal welfare

Since 1978, the EU has established a variety of legislative acts regarding animal welfare. Under the provisions, animals are considered sentient and therefore, welfare requirements when implementing new agriculture policies and in production should be applied to them. Today, the animal welfare legislation in the EU is the most advanced set of rules in this branch worldwide. It holds provisions regarding farming of all kinds of livestock, during transportation and slaughter. Member states of EU has an obligation to implement these rules, and experts from the European Commission make sure that local authorities occasionally control the farms. The commission also put efforts to raise awareness of animal welfare and healthy consumerism through various educational programs. The *European Convention for the Protection of Animals kept for Farming Purposes* of 1978 provides general rules for the production of all animals kept for production.

EU rules on animal welfare is presented by five freedoms:

- Freedom from hunger and thirst
- Freedom from discomfort
- Freedom from pain, injury and disease
- Freedom to express normal behavior
- Freedom from fear and distress

(Council of Europe, 1976)

The rules for *the protection and welfare of animals during transport* were adopted in 2004. However, as these rules had not been always followed accurately by the producers, there were failures in application of new resolutions. In 2019, EU commission demanded to control better that factories do follow these rules, harsher sanctions were applied, and transport times were shortened. (European Parliament, 2019)

Despite the fact that that set of rules about animal welfare are applied across the EU, there are still difficulties with ensuring that these rules are followed precisely, and breaches happen from time to time. Consequently, European Union legislation regarding animal welfare, meat health and sustainability is always subject to modifications. For example, current program called



“Farm to Fork” (presented in May 2020) proposes new set of laws associated with animal farming, modifies current animal welfare rules and creates new ones, revisions usage of pesticides, reforms ways of utilizing natural waste.

The main goals of this program are to reduce the environmental impact of agriculture, ensure safety of food. Goals for a next decade are (till 2030):

- “50% reduction in the use and risk of pesticides
- at least 20% reduction in the use of fertilizers
- 50% reduction in sales of antimicrobials used for farmed animals and aquaculture
- 25% of agricultural land to be used for organic farming”

(European Parliament, 2020)

### 3.5.2 US Welfare legislation

In the US, laws can be proposed and enforced at every government level. Therefore, a common system for animal welfare in the US is not so well conducted and states can decide for themselves what kind of regulations need to be applied. The only federal acts approved across the country are:

- The Animal Welfare Act. (1966). Regulates handling of animals kept in zoos and laboratories.
- The “28 hour” law (1873). Regulates transporting of the animals. When transporting livestock for slaughtering, vehicle is to stop every 28 hours and let animals out – to roam around, eat and drink. However, this is not regulated well and there are many ways to breach the regulation. The law is not applied if there is an access to food and water directly in the vehicle. Moreover, it is not applied to poultry (chicken and turkeys)
- The Humane slaughter Act (1958) The law regulates pain of a livestock by requiring that animals need to be unconscious before being slaughtered. Although poultry is a big part of meat production, it is also not included and not protected in this law. (Animal Legal Defense Fund)

## **3.6 Modern alternatives to intensive farming systems**

As global population increases, demand for meat products and protein sources increase, too. However, issues mentioned above push governments, consumers and producers to seek for alternatives. Nowadays, two most acknowledged alternative forms of meat and “meat-alike” products are plant-based meat (meat based on plant proteins) and innovational and actively developing so-called “clean meat”. Moreover, there is also alternative way of producing real meat – grass-fed meat.

### **3.6.1 Grass-fed meat**

Grass-fed meat is an alternative way of meat production. Meat labeled “grass-fed” means that animals used for such meat had natural grass in their diet and mostly lived natural life without stress (based on animal welfare requirements above) on pastures. (Ruechel, 2012)

There are numerous proven health and environmental advantages of such production system. Study conducted by a University of Wisconsin showed that natural pastures increase soil fertility and diversity, increase animal welfare.

There also some health benefits in such meat. Health benefits associated with grass-fed met are lower fat and calories content and higher concentration of vitamins A, E, Omega-3 fatty acids, which contribute positively to lower cholesterol and blood pressure, decreased risk of diabetes. (Paine, et al., 2009)

### **3.6.2 Plant-based meat**

Plant-based meat is derived from plant ingredients; it is still called meat because the main goal of the product is to replace meat and be a satisfying alternative by imitating meat’ nutritional profile, it’s structure and taste. Ingredients such as peas, soya beans and wheat are collected, processed to extracts and then transformed to a meat-like alternative. Production with these particular ingredients have significantly lower greenhouse emissions, (Poore, et al., 2018), it requires less water, (approximately 72% less water, L-water/kg-meat) (Dettling, et al., 2016) it needs no antibiotics. However, alternatives to conventional meat are relatively new concepts, including plant-based meat. It became available on the markets since 2013, and still, because of the technology being relatively new, the trust and habit for such meat is not yet gained. For example, in the US, it makes less than 2% of total meat market. (The Good Food Institute, 2018) Moreover, the price for plant-based meat is higher than for a factory meat. (e.g., Burger meat – (plant-based) 437,61 Kč / kg vs 189,90 Kč / kg (Beef), source: Kosik.cz) But

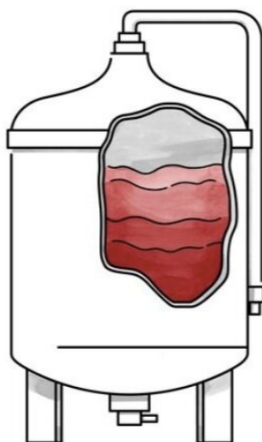
government and investors monetary support, in-depth research to make plant-based food even more similar to general meat and more affordable, communication and informing customers with new alternatives can make a plant-based meat a passable alternative for general one.

### 3.6.3 Cultured meat

Another contemporary solution to decrease consumption of livestock meat is a developed “clean” or cultured meat. The final product is a fully grown meat raised from animal cell without the need to slaughter the livestock. (Post, 2012) By eliminating the need of animal slaughter, cultured meat can have impact on increasing animal welfare, decreasing diseases outbreaks, have positive influence on the environment. Clean meat is considered to have a dramatically lower level of greenhouse emissions and use of water. (Tuomisto, 2018). The most acknowledged companies developing the technology is a Dutch food technology company called “Mosa Meat” and American company “Memphis meats”. The process of the cell-based meat production is not yet well explained and illustrated on the official websites; however, the constraints are:

Memphis Meats explanation:

- 1) Sample is selected and taken from the variety of sources (e.g., alive animal under anesthesia, remains of a general meat, eggs, fish) The aim is to pick a cell that is capable to restore and renew itself.
- 2) Feeding one cell with nutrients that are typical for food and animal composition (amino acids, sugars, trace minerals, and vitamins)
- 3) Due to natural feeding, the cell transforms into a muscle and a connective tissue in a so-called cultivator.

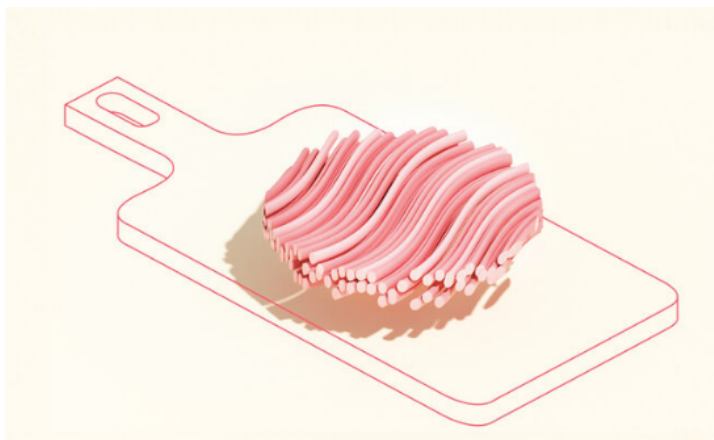


**Figure 12. Memphis Meats "Cultivator"**  
Source: (Memphis Meats)

- 4) It takes from 4 to 6 weeks to raise a full-grown meat from a cell in the “cultivator”. The meat is harvested and presented as a finished product. (Memphis Meats)

Mosa meat explanation:

- 1) 0,5-gram sample is taken from cows under anesthesia.
- 2) After standardized veterinary procedure, approximately 33 000 myosatellite cells (muscle stem cell) are taken.
- 3) Oxygen-rich natural environment with nutrients is replicated, and cells multiply into trillions of new ones.
- 4) After some time, in conditions chemically identical to a cow body, muscle cells and fat merge and turn into 0,3 mm fibers



**Figure 13. Cell-grown fibres**  
Source: (Mosa Meat)

- 5) Placed in a gel consisting of 99% water, fibers turn into muscle tissue and then reach the maturity. Muscle and fat tissue form to a ready-to-cook meat product. (Mosa Meat)



**Figure 15. Finished cell-grown meat (Beef)**  
(Memphis Meats)



**Figure 14. Finished cell-grown meat (Duck)**  
(Memphis Meats)

The technology of both companies is still under a development, however in a race to be the first firm to launch an innovation, both companies hope and predict to launch the product in 2021-2022.

## **4 Practical part**

In this part of the thesis, I have tried to research attitude towards meat-eating, conventional meat from factories, meat-eating habits among young people from Russia and Europe. Also, I have introduced them with some alternatives which I have been speaking of in the last part of my bachelor thesis and asked about their attitude towards it, if they would be willing to replace usual conventional meat with these alternatives. The goal of this survey is to find out which place in their life takes meat-eating, if it is something extremely important and irreplaceable for them, what level of knowledge have young people about meat products they usually eat, compare it with the idea that I stated before – that people often have misconceptions about factory farming – not knowing fully about the ethical issues I stated before, being unsure about the realities of intensive farming or exaggerating its impact, for example on viruses spreading and epidemic risks.

### **4.1 Survey**

The survey was conducted with the help of google forms and processed with an app extension for it, which is called “Advanced Summary” created by Awesome Gapps developers. The survey was spread in social medias, such as Instagram and Facebook and sent to young people, mostly students. Moreover, it was sent by Whatsapp, Vkontakte social media to Russian students living in Prague and Erasmus students living in Prague. The survey was answered by 71 people from Russia and Europe. In the demographical questions section, I did not ask where exactly they come from as it is not crucial in terms of getting the desired information – meat/young people relationship. Moreover, I did not use all the questions I asked for a practical part because some of them were almost repetitive, some of them appeared pushing or at some point, provocative. All the questions of the survey can be found in the Appendix.

## 4.2 Results and Discussion

### 4.2.1 Demographics of the audience

The target audience of the conducted research were young people who are active users of internet and social medias because, as I have stated before, misconceptions about industrial animal farming can come from the lack of education regarding healthy and nutritional eating, real information from the producers, manipulative or false information in these media sources.

What is your age?

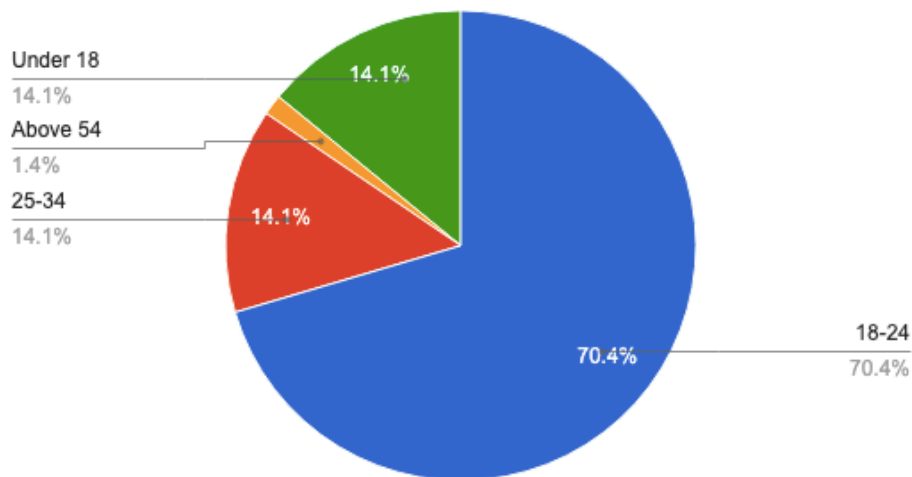


Figure 16. "Age" question' answers

Source: (Authors own work; Google Forms; Awesome Gapps , 2021)

What is your highest level of completed education?

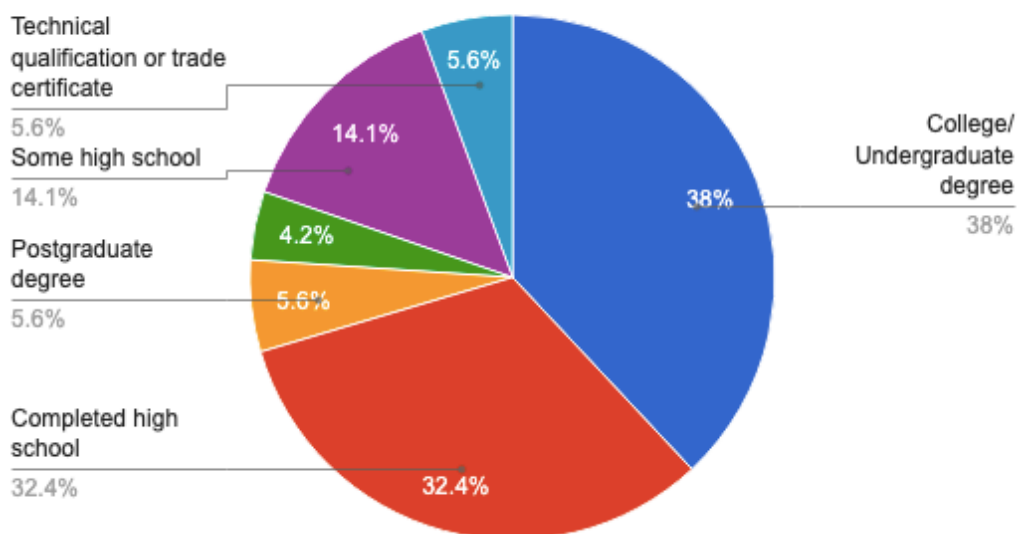
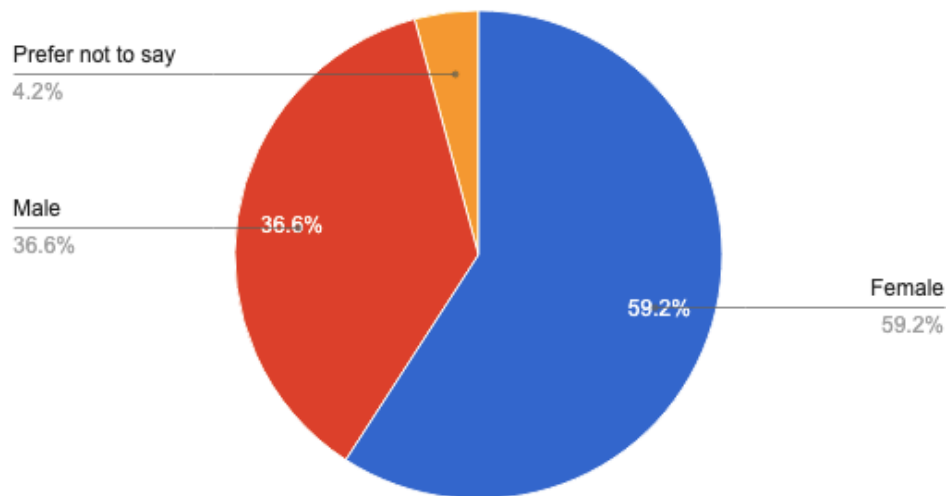


Figure 17. "Education" question' answers

Source: (Authors own work; Google Forms; Awesome Gapps , 2021)

What is your current gender identity?



**Figure 18. "Gender" question' answers**

Source: (Authors own work; Google Forms; Awesome Gapps , 2021)

Three pie charts above show that the target audience and real people who took the survey match. People who participated are mostly between 18-24 years old (70,4%) The next prevailing groups are equal – these are people under 18 and people from 25 to 34 years old. – 14,1 % each. Therefore, education level varies from College/Undergraduate Degree and a High school education. This means that at least some level of knowledge about what is ethics and what kind of questions it addresses are acquired by people in schools and universities. Regarding the gender division, almost 60% of respondents were female and 36,6% were male.

#### 4.2.2 Questions regarding meat-eating habits

In this part of survey, I have asked the respondents about their habits in terms of meat eating. I have asked them what kind of meat they usually buy and eat, how many meals in their daily life include meat and at what time of the day meat meals are more preferable for them.

#### 4.2.2.1 Livestock products by popularity

The first task that I asked was to list all the meat and dairy products people eat at least occasionally. 71 people could choose between all these products or say that they do not consume these products at all. As we can see from the results, only 3 people out of 71 (4,1%) do not consume such products at all. And between those who eat dairy and meat products, the most popular ones are dairy products –yogurts, ice cream, cheese and milk – the ones that consist of milk. They are in the top of all products mentioned above and share the votes that way:

Which of the following do you eat at least occasionally?	Top results ▼
yogurt	56
ice cream	56
cheese	56
butter)	56
Dairy products (milk	56
Eggs	49
turkey	45
duck)	45
Poultry (chicken	45
shrimp	38
oysters)	38
lobster	38
Fish or shellfish (tuna	38
Beef	37
ribs)	33
ham	33
Pork (bacon	33
goat)	10
Mutton (lamb	10
I never eat any of the above	3

**Figure 19. Which of the following do you eat at least occasionally?**

Source: (Authors own work; Google Forms; Awesome Gapps , 2021)

- **56/71 (78.87%)** people eat yogurts, ice creams, cheese, butter, and drink milk at least occasionally,
- **49/71 (69%)** people consume eggs at least occasionally or on a daily basis,
- **45/71 (63.38%)** eat any of those poultry products (turkey, duck, chicken),
- only half of the respondents, which is **38/71 people (53.5%)** consume fish products such as tuna, shrimp, oysters or lobsters,
- Same, half of the respondents eat beef at least sometimes - **37/71 people (52.1%)**
- **33/71 (46.5%)**, which is less than half of the questioned people eat pork products (bacon, ham, ribs) daily or occasionally,
- Mutton products, such as goat meat and lamb are consumed only by **10/71 people (14.1%)**

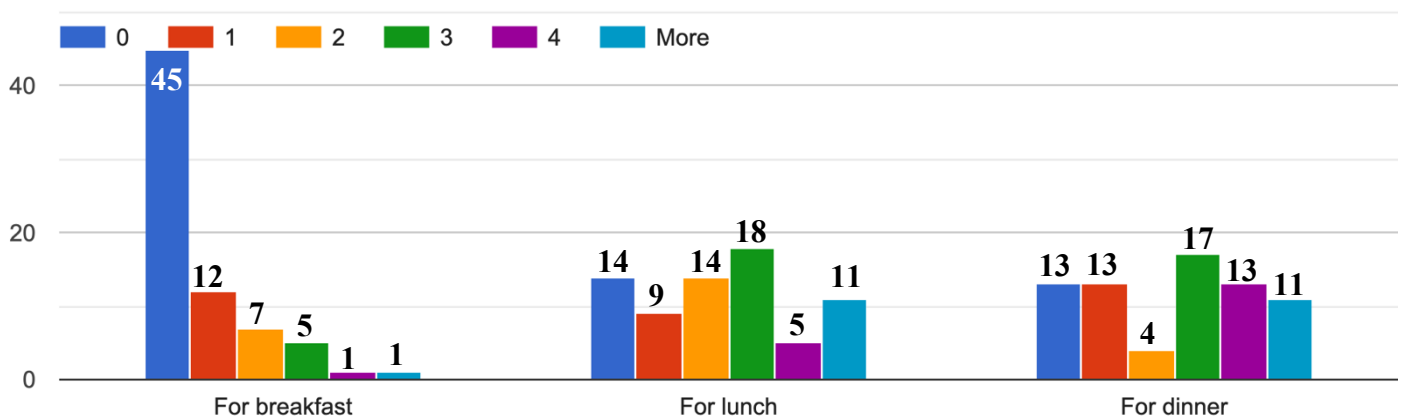


Based on these answers, we can see that eating meat and dairy products is common among the majority of European young people. Dairy and meat products are eaten either on a daily basis or at least occasionally (by 95.8% of people), but a small group of those who do not eat any of these products also exists (only 4.2%).

#### 4.2.2.2 Number of consumed meat meals per week

Secondly, I wanted to evaluate, what is the approximate number of meals with meat that people consume weekly and find average number of such meals eaten throughout the week, distinguishing between different times of the day. The initial goal of this question is to discover when eating meat is more favorable by young generation This information could be useful for developing more successful communication with them (e.g., in terms of nutritional education, informing them about factory farming). The audience was asked to highlight how many of such meals in total they usually eat for breakfast, lunch and dinner during the week.

On average, how many meals with meat per week do you consume?



**Figure 20. Number of meat meals per week question**

Source: (Authors own work; Google Forms; Awesome Gapps , 2021)

The answer options were stated from zero to more than 4. Answers to this question can be inaccurate because sometimes it is hard to remember the accurate number of meals eaten per week. Therefore, we can suggest that answers can be counted approximately by the participants. Considering the results, the answers distribution varies; however, it is almost even within lunch and dinner questions. The only ultimate answer applicable for the majority of participants was that they do not consume meat products for breakfast at all. Highlights from these answers are:

- Eating meat for breakfast is not popular among most of the young people – 45/71 (63.4 %) of them stated that they consume zero meat meals for breakfast during the week. The next popular answers are: one meat-containing meal per week – 12/71 (17%), from two to three meals with meat are also consumed by 12 people, and only 2/71 (2.8%) eat four or more meat meals per week.
- Eating meat for lunch varies almost evenly from 0 to more than 4 meals per week. 14 people out of 71 (19.7%) stated that they eat zero meat meals; and 14 people as well said that the average number of meat meals they eat per week is two. The majority of participants is 18 (25.35%) and they stated that they eat three meals with meat per week. One meat meal per week is usually eaten by 9 people out of 71 (12.68%), four or more meals are consumed weekly by 16 people (22.54%).
- Considering the dinner, the distinction between number of meals per week is also almost even. 13 people out of 71 (18,31%) voted evenly for three options: zero, one and four meals per week. The majority number of people – 17 in total stated that in average, they consume 3 meals containing meat during the week. More than four meat meals in average are consumed by 11 people (15.49%). And only 4 people (5.63%) said that averagely they eat 2 meals with meat per week.

Concluding the information above, we can see that there is no particular common tendency in terms of eating meat in one or other time of the day. The habits of young people in eating meat during the day vary, and no generalizing conclusion can be based on these exact answers.

#### **4.2.3 Questions regarding the attitude towards meat eating.**

Third part of the survey was dedicated to the questions about common perception of meat as a general part of their life. All the questions in this section were constructed the same way. I have proposed several claims and asked, to what degree do they agree with them. The questions I asked regarded their associations connected with meat eating and their personal attitude towards meat being a general part of their life. The goal of this part of this survey was to find out to what extent meat eating is important for them, and if they would picture themselves without meat at all. Optional answers for questions in this survey part are:

- 1) Strongly agree
- 2) Somewhat agree
- 3) Neutral
- 4) Somewhat disagree
- 5) Strongly disagree

#### 4.2.3.1 “Eating meat is one the pleasures in my life”

First proposed statement is: “Eating meat is one of the pleasures in my life”. The results below vary almost evenly and we cannot state that meat is either certainly associated with pleasure or not. However, we can see from the graph that the majority of participants (18/71 – 25.4%) voted for an uncertain answer “Somewhat agree”, and which can lead to a conclusion that they may not be sure whether meat-eating brings them pleasure, if they necessarily feel enjoyment while eating meat meals; they may think that if judging meat eating by terms “pleasure-displeasure”, it is rather delightful than not delightful at all. The answers “Neutral” and “Strongly disagree” share the same number of answers – 17 (23.9%). “Somewhat disagree” answer shares votes of 11 people (15.5%), From that result we can state that more than 50% of respondents either have no opinion about meat being a pleasure, (meat is simply a meat, it is not repulsive but not so certainly delightful either) or they hold an opinion that meat meals do not bring them any particular enjoyment. The least popular answer is “Strongly agree” – it is chosen by 8 people (11.3%).

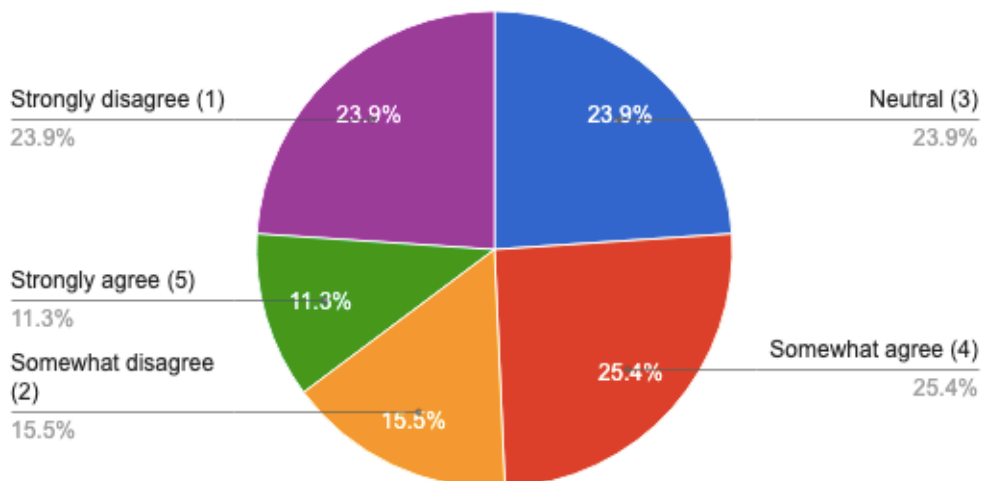
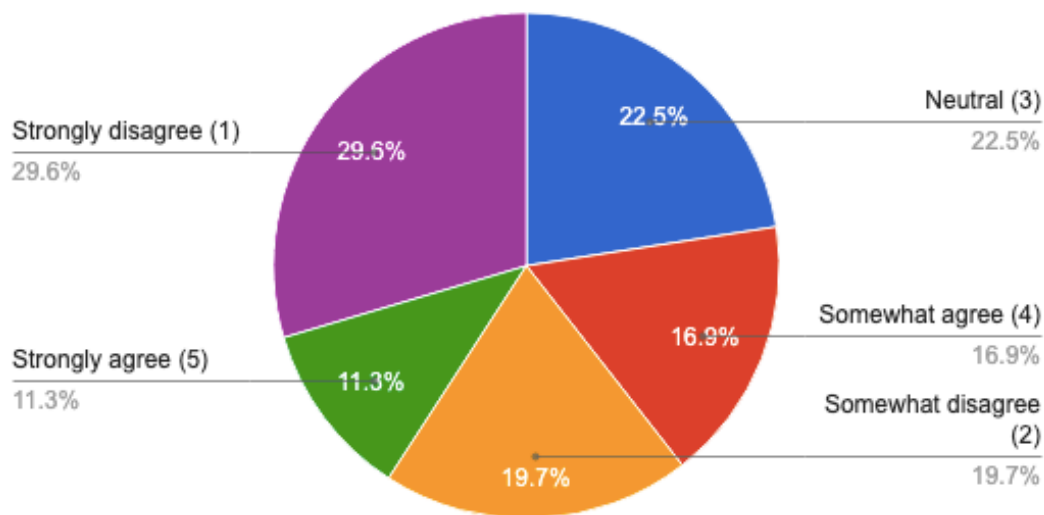


Figure 21. "Meat is one of the pleasures in my life"

Source: (Authors own work; Google Forms; Awesome Gapps , 2021)

#### 4.2.3.2 “Meat is irreplaceable for me”

The second statement was: “Meat is irreplaceable for me”. The biggest share of answers is “Neutral” – 16 participants (22.5%). The next popular answers are “Strongly disagree” - 21 of 71 people (29.6%), “Somewhat disagree” – 14 people (19.7%). The least widespread answers are “Strongly agree” - 8 people (11.3%) and “Somewhat agree” – 12 people (16.9%). From this data, we can see almost half of participants (49.3% - “Strongly disagree” and “Somewhat disagree”) are either the opinion that meat probably is not irreplaceable for them, but they are not sure (maybe they have not tried to do it), or they strongly believe that replacing meat with some alternatives would be not that hard for them.

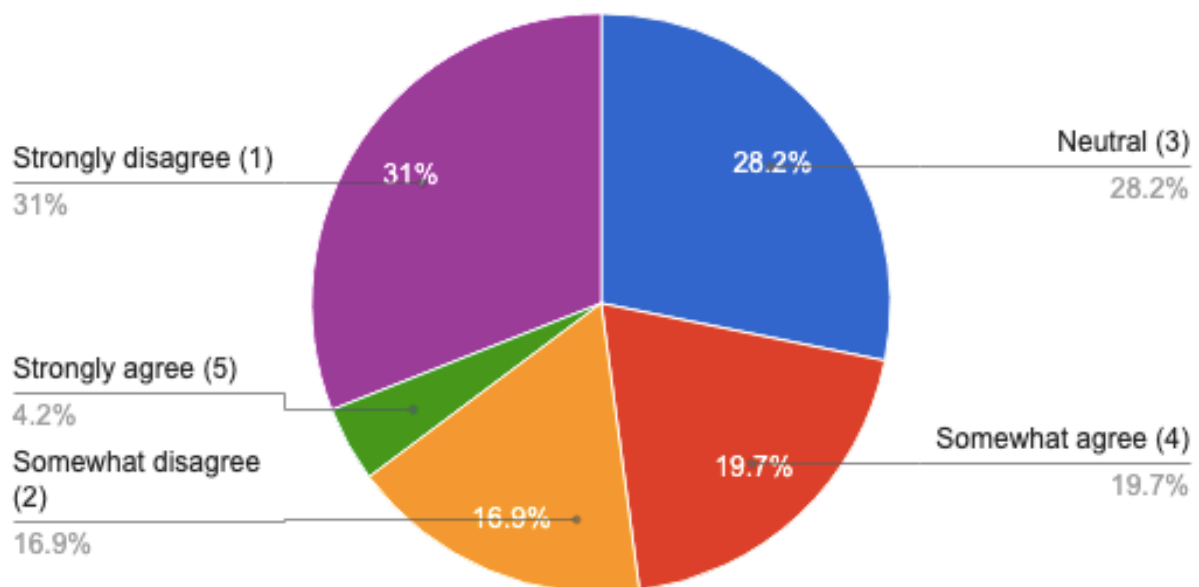


**Figure 22. “Meat is irreplaceable in my diet”**

Source: (Authors own work; Google Forms; Awesome Gapps , 2021)

#### 4.2.3.3 If I could not eat meat, I would feel weak

The third statement to think about was: “If I could not eat meat, I would feel weak”. The meaning of this question is, that if people would stop eating meat, would they feel worse because of lack of nutrients? Answers are not distributed evenly; Some of the participants have chosen “Neutral” answer. (20 people – 28.2%), some of them answered “Strongly disagree” (22 of 71 people – 31%) By that, we can suggest that “strongly disagree” group, if was not eating meat, would not think they lose necessary nutrients, or they would find alternative sources of such nutrients. However, “Somewhat agree” answer chosen by 14 people (19.7%) and “Strongly agree” variant chosen by 3 people (4.2%) suggests that in this scenario these participants probably would not know the way to compensate nutrients of meat.



**Figure 23. "If I could not eat meat, I would feel weak"**  
(Authors own work; Google Forms; Awesome Gapps , 2021)

#### 4.2.3.4 Conclusion to the section

Results from these questions show us that meat eating is generally common for young participants. Most of them eat meat at least once a week and only small part of the asked people said that they never eat any of those. Poultry meat, especially chicken is the most consumed product among those people, and it correlates with global statistics – chicken meat is the most produced and consumed type of meat across the globe. Therefore, increasing animal welfare in this sphere in order to reduce associated risks stated before is essential. Answers about three last statements show us that attitude towards meat-eating among young consumers cannot be generalized. Fourth of the survey population are the opinion that meat might be a pleasure for

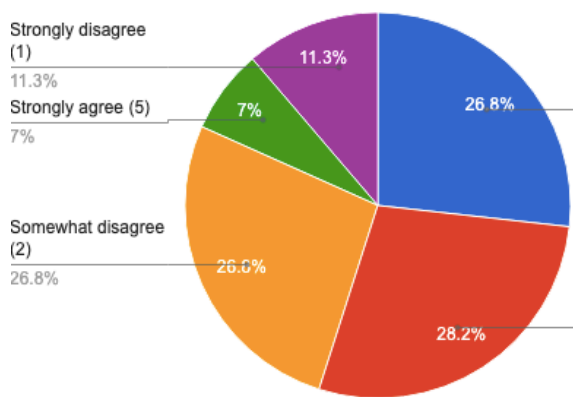
them, but they are not so sure about it. And almost half of them think that meat does not necessarily bring them pleasure but that it is just a usual part of their life. Imaginary situation that they stopped eating meat does not scare most of them, almost half of them believe they would be feeling fine, with meat or without it. Therefore, if alternatives were proposed more globally and they were more available, there could be willingness among young people to try or switch to something new. In the next section of the survey, I will research attitude towards products of intensive farming system and also this willingness question more thoroughly.

#### 4.2.4 Attitude towards conventional meat

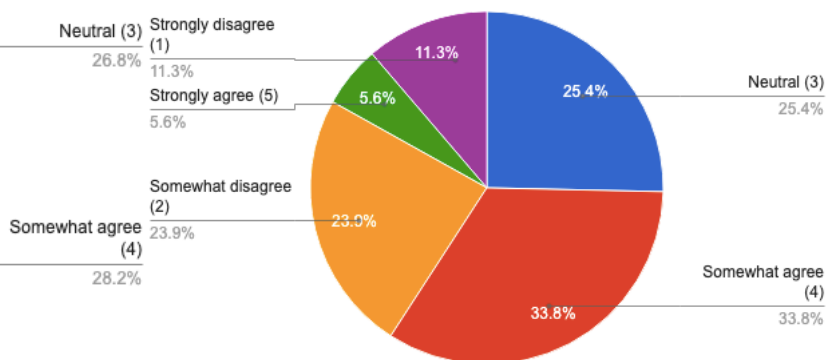
In the survey, I have asked people eleven questions to find out what they think about conventional meat. Beforehand, above the questions, I have explained what is understood by term “conventional meat” - Conventional meat is the meat you would normally find at a supermarket. The goal of this part of the survey is to research whether consumers have trust to conventional meat, if they are aware of these ethical issues stated in previous part of my thesis. Same as in the “attitude towards meat eating” part, people were given some statements and asked, to what degree they agree with them.

##### 4.2.4.1 Conventional meat is “Healthy”, “Natural”, “Impacting the environment”

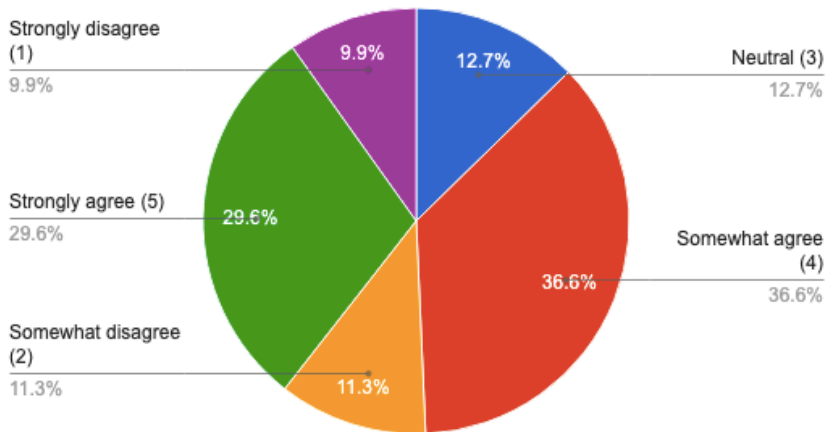
Conventional meat is “Healthy”, “Natural”, “Impacting the environment” were the first statements to reflect on.



**Figure 25. "Conventional meat is healthy"**  
 Source: (Authors own work; Google Forms; Awesome Gapps , 2021)



**Figure 24. "Conventional meat is natural"**  
 Source: (Authors own work; Google Forms; Awesome Gapps , 2021)



**Figure 26. "Conventional meat is impacting the environment"**  
 Source: (Authors own work; Google Forms; Awesome Gapps , 2021)

Let us discuss every graph separately.

### 1. "Conventional meat is healthy"

As seen on the graph, there is almost an even distinction between three options – "Neutral", "Somewhat agree", "Somewhat disagree". 20 of 71 (28.2%) chose option "Somewhat agree", and 19 people (26.0%) have chosen "Somewhat disagree" or "Neutral". We can assume that these answers are not a strict opinion of young people, they are more likely making assumptions about the healthiness of meat products they consume. The minority of chosen answers were strongly affirmative – "Strongly agree", or "Strongly disagree". From this particular result, we can assume that most of the people did not choose strictly assertive answers because they may not have sufficient knowledge of nutrient base or health advantages of conventional meat. From this we can suggest that one of the possible directions in making food choice a deliberate process, is improving awareness in terms of eating is to provide further health and food education, which is a duty of producers and the government.

### 2. "Conventional meat is natural"

By saying "natural" in this statement, it is meant that conventional meat does not contain any chemical residuals (e.g., dioxin, antibiotics). The goal is to gain information, whether consumers are aware that the meat they are buying may contain some of these chemicals. The majority of voters, (24 people - 33.8%) chose the option "Somewhat agree", meaning they assume it is natural. And the next ones in popularity are options "Neutral" or "Somewhat disagree" – 18 and 17 people (25.4% and 23.9%) respectively. As in a previous question, only 12 people (16.9%) chose affirmative options ("Strongly agree" or "Strongly disagree").

Therefore, same conclusion can be made out of this piece of information – knowledge base of surveyed people is not enough to be sure, whether it is really natural or not.

### 3. “Conventional meat is impacting the environment”

In the chapter “Environmental impact”, I have described some of the environmental consequences intensive animal farming leads to. In order to know if general public is aware of those damages, this particular statement was proposed. As seen on the graph, the majority of asked participants chose an agreement option “Somewhat agree” and “Strongly agree” (26 people – 36.6% and 21 people – 29.6% respectively). From that we can make an assumption that more than half of participants are aware that intensive animal farming is a pollutive process. But still, 15 people out of 71 answered “Strongly disagree” or “Somewhat disagree” (7 and 8 people, 9.9% and 11.3% respectively).

#### 4.2.4.2 Conventional meat is “ethical”, “safe”, “necessary”

Conventional meat is “ethical”, “safe”, “necessary” – these statements were proposed to participants in the next part of the survey. I asked these questions to know if young consumers, have trust towards conventional meat, if they, with their own ideas about what ethics is, would consider that products of intensive animal farming are made ethically. Moreover, is intensive animal farming considered necessary for them, meaning no matter if there are any issues for them, the products and the process of making the meat is not avoidable and it is necessary.

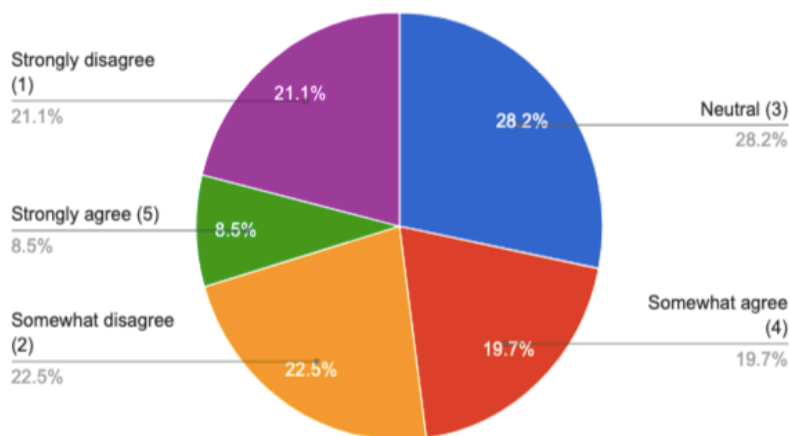
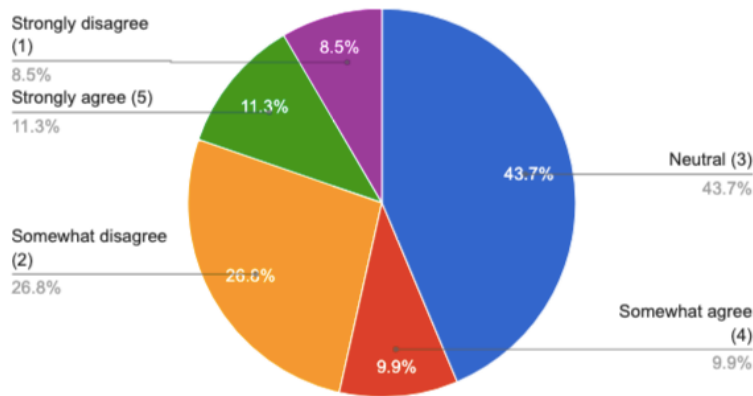


Figure 27. "Conventional meat is ethical"

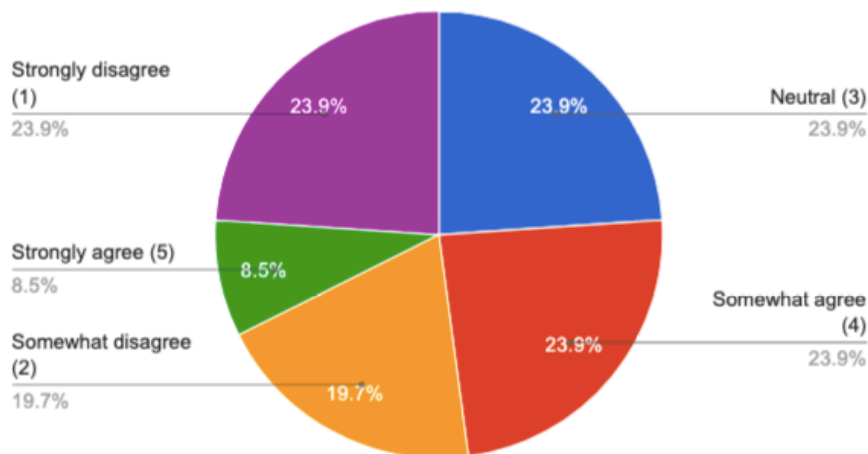
Source: (Authors own work; Google Forms; Awesome Gapps , 2021)





**Figure 29. "Conventional meat is safe"**

Source: (Authors own work; Google Forms; Awesome Gapps , 2021)



**Figure 28. "Conventional meat is necessary"**

Source: (Authors own work; Google Forms; Awesome Gapps , 2021)

Let me explain each one of the pie charts.

### 1. "Conventional meat is ethical"

Beforehand, I did not explain to participants, what is understood by term ethics in order to find out their perception towards ethics and intensive animal farming based on their own experience and knowledge. Judging by the answers, we can see that most of the participants inclined to give uncertain answers "Neutral" – 20 answers (28.2%), "Somewhat disagree" – 16 answers (22.5%). More than 50% of participants are not sure, whether factory farming is ethical or not. It may be because they do not fully know how factory farms operate, their understanding of term "ethics" is not so sufficient to give any certain judgements, or they do not know how to apply their ethical ideas to factory farming in particular. However, 22.5% of these 50% still incline to think that conventional meat products are rather unethical than not. The next majority of votes are distributed between answers "Somewhat agree" and "Strongly disagree" – 19.7% and 21.1%, which are almost the opposites. We can see that the opinions will vary based on

one's personal association with term ethics. However, huge part of participants still chose negative answers. From that we can conclude that generally young people are aware of the existing ethical issues.

## **2. “Conventional meat is safe”**

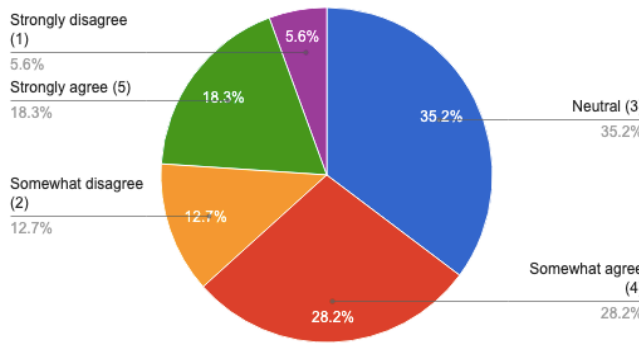
Back before, I listed some possible health outcomes of intensive meat production – contamination risks, risks of meat containing antibiotics/antibiotic residues. This statement proposed to participants is meant to find out whether they have trust towards meat they eat, if they are aware of risks stated above. As seen on the pie chart, nearly half of the participants did not give positive nor negative answer – they chose “Neutral” option (31 people – 43.7%). Such answer can lead to some assumptions: people have never wondered if meat they buy could ever be unsafe, they are not aware of what kind of risks meat may have. The next answer that was chosen by big part of participants is “Somewhat disagree” (19 people – 26.8%). However, “Strongly disagree” answer is a minority in this question - 6 answers (8.5%). An uncertain answer could mean that people might think conventional meat might be unsafe, but they do not how exactly. Anyway, they incline to think that it is rather unsafe than safe. Consentient opinions – “Strongly agree” were chosen only by small part of participants - 8 people (11.3%) and 7 people (9.9%) respectively.

## **3. “Conventional meat is necessary”**

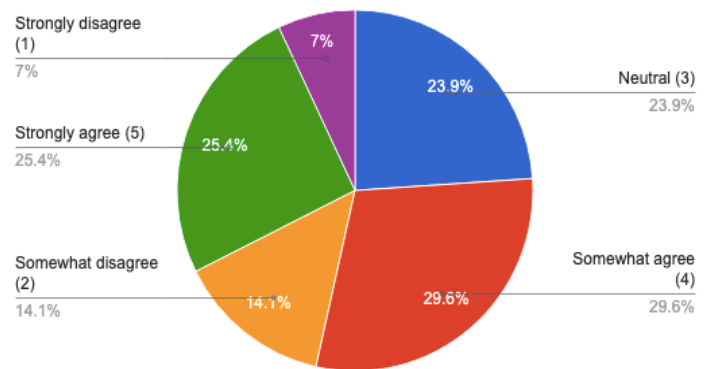
Even when considering different opinions students may have regarding meat processing impacts, or safety and ethics, would young participants consider conventional meat unavoidable/necessary process? To find out is the aim of this question. The opinions distributed evenly between three quite controversial statements – “Neutral”, “Somewhat agree”, “Strongly disagree” – 17 people (23.9%) each. We can see that among young people, there is no common opinion whether factory farming is necessary. “Somewhat agree” group might think that it is necessary, because it basically provides them with meat and they do not know, where else could they buy meat if not in the supermarket. From “neutral” group answers we might suggest that, again, lack of information does not allow them to make a deliberate judgement. “Strongly disagree” answer might mean that audience is sure that conventional meat production is an unnecessary process. They may be using alternative sources of meat already, or they are aware that such sources exist and that they are available.

#### 4.2.4.3 Conventional meat is “nutritious”, “tasty”, “expensive”.

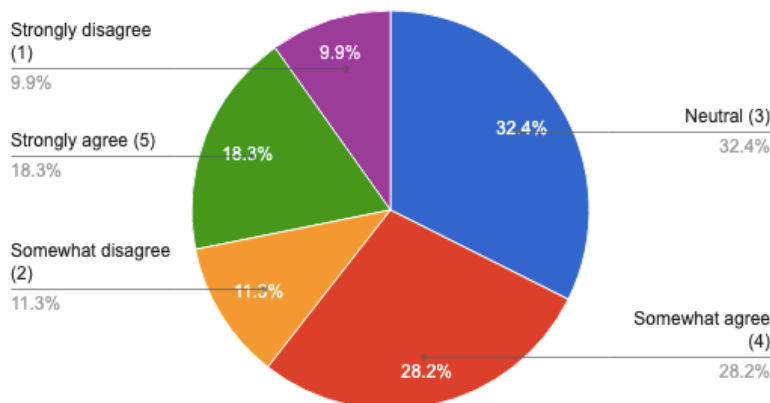
Conventional meat is “nutritious”, “tasty”, “expensive”. The aim of this part of the survey is to find out whether such meat is indeed an affordable and easily accessible resource for young consumers. Moreover, these questions can tell us more if buying such meat “pays off” for them in terms of being a delicious and nutritional product.



**Figure 30. "Conventional meat is nutritious"**  
Source: (Authors own work; Google Forms; Awesome Gapps , 2021)



**Figure 32. "Conventional meat is tasty"**  
Source: (Authors own work; Google Forms; Awesome Gapps , 2021)



**Figure 31. "Conventional meat is expensive"**  
Source: (Authors own work; Google Forms; Awesome Gapps , 2021)

#### 1. Conventional meat is “nutritious”.

Again, the majority of the participants chose an uncertain option – “Neutral” (25 people - 35.2%). That means that more than 30 % of the surveyed people are not holding onto any certain opinion due to lack of knowledge or concernment about this topic. However, “Strongly agree” and “Somewhat agree” groups also take a significant share of votes – 18.3% (13 people), 28.2% (20 people). Therefore, we can conclude that some of the people know what nutrients meat brings. The only question is whether they distinguish conventional meat from factories and meat raised more naturally (grass-fed meat). The disagreement group in this case became

a minority – only 18.3% in total for “Strongly disagree (4 people - 5.6%) and “Somewhat disagree” (9 people – 12.7%). We can conclude that young consumers in general have either no opinion about this topic or incline to think that conventional meat is nutritious.

## **2. Conventional meat is “tasty”**

Back before, I asked people if they associate meat with pleasure in their life. Answers distributed evenly – no common opinion for the whole population was found. The aim of this question is to know whether the same result will appear with the term “Tasty”. Despite the fact that agreement answers were a minority when asked about pleasure, conventional meat is considered tasty by most of the participants – “Somewhat agree” and “Strongly agree” have scored 29.6% (21 people) and 25.4% (18 people) respectively. Therefore, we can state that taste of meat is a recognizable and likeable feature of the product. That can lead to a statement that for alternative sources of meat it is vital to have same meat taste to gain popularity among the consumers. “Neutral” answer has a share of 23.9% of all answers (17 people). For those people, conventional meat can be considered a necessity or just a simple product without any additional “pleasurable” and “tasteful” features. For those who chose disagreeable options “Somewhat disagree” and “Strongly disagree”, which are the minorities (10 people – 14.1% and 5 people – 7% respectively), meat can be associated with negative emotions or there is a chance they reject meat completely.

## **3. “Conventional meat is expensive”**

Is conventional meat affordable for young consumers in Russia and Europe? The majority of votes is gained by “Neutral” variant – 32.4% (23 people). Choosing a neutral and not affirmative option can be explained in some ways: some of the participants are relatively young (under 18) and also those in interval 18-25. There can be a chance that some of these participants are under parents’ care (financial or full) – consequently they do not buy meat themselves, do not earn money themselves and do not have a clear idea whether conventional meat is a significant part of one’s income and expenditures. Agreeable options are next in popularity among the consumers – 13 people out of 71 answered “Strongly agree” (18.3%) and “Somewhat agree” - 28.2% (20 people). Disagreeable options remained a minority – “Somewhat disagree” has only 8 votes (11.3%) and “Strongly disagree” gained 7 votes (9.9%). We can conclude that opinions among young consumers whether conventional meat is expensive vary. Such meat can be considered expensive for some of them because their own income is not so high yet.

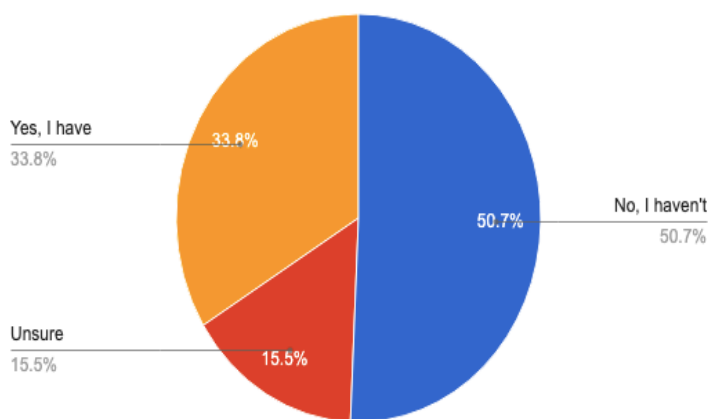
#### 4.2.5 Suggestions of alternative sources

From previous section of my survey, I stated that meat is not considered irreplaceable by majority of surveyed people. To examine this more thoroughly, I proposed to the audience alternative sources of meat which I spoke about in the end of the literature review. I asked them questions if they would be willing to try it or buy it on a daily basis.

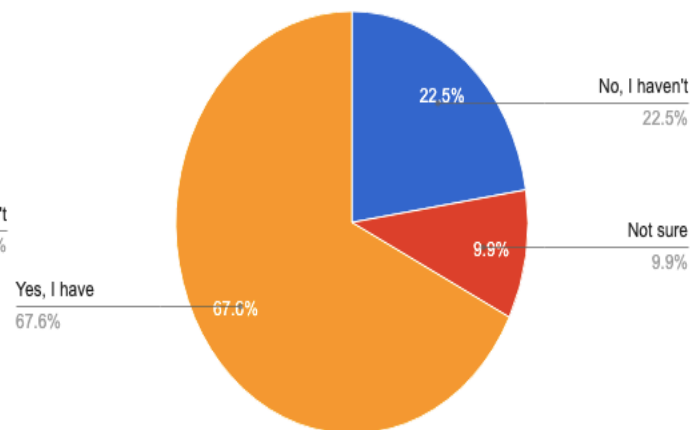
##### 4.2.5.1 “Clean meat” and “Plant-based meat”

###### 4.2.5.1.1 Recognition of the terms

The first question was asked to find out if young consumers know these alternatives sources at all. I have asked if they know term “Clean meat” and “Plant-based meat”.



**Figure 34. "Have you heard of term clean meat?"**  
Source: (Authors own work; Google Forms; Awesome Gapps , 2021)

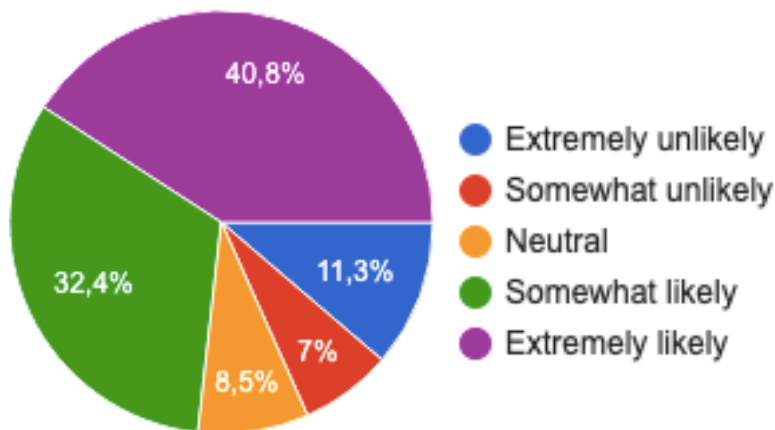


**Figure 33. "Have you heard of term plant-based meat?"**  
Source: (Authors own work; Google Forms; Awesome Gapps , 2021)

More than 50% of respondents answered that they did not know term “Clean meat” before. It is indeed a new concept. As for plant-based meat, it is now more or less widespread product, therefore, almost 70% of respondents know this term.

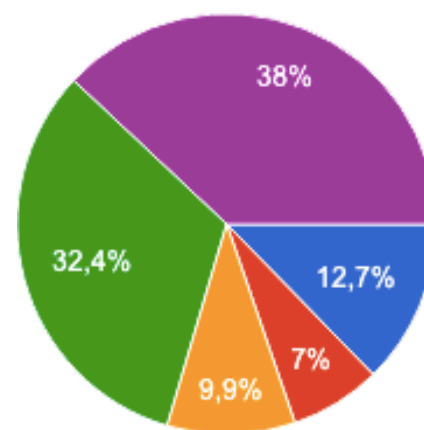
###### 4.2.5.1.2 How likely would you try alternatives?

“Imagine that clean meat/plant-based meat became available in the shops. How likely would you try it?” As seen on these pie charts, answers distribution is the same, the willingness to try both of these products is high. The majority (40,8% and 38%) of participants show high responsiveness to new products. 32,4 % of participants in both cases would likely try it, if it is available but they may be not sure when it will happen.



**Figure 35. How likely would you try clean meat?**

Source: (Authors own work; Google Forms; Awesome Gapps , 2021)

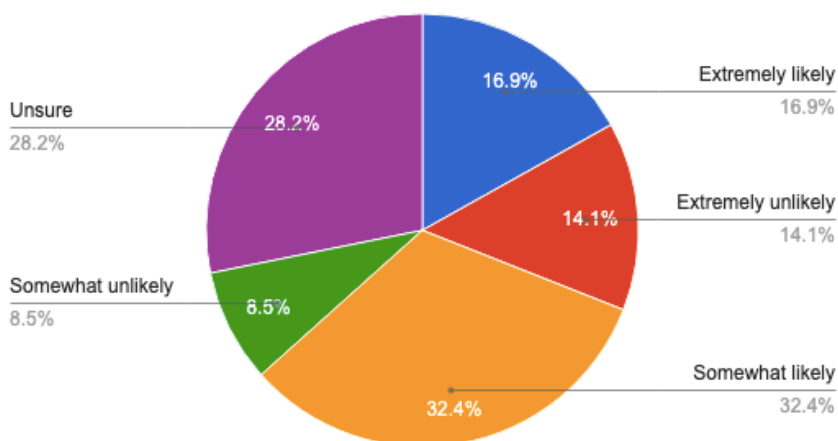


**Figure 36. How likely would you try plant-based meat?**

Source: (Authors own work; Google Forms; Awesome Gapps , 2021)

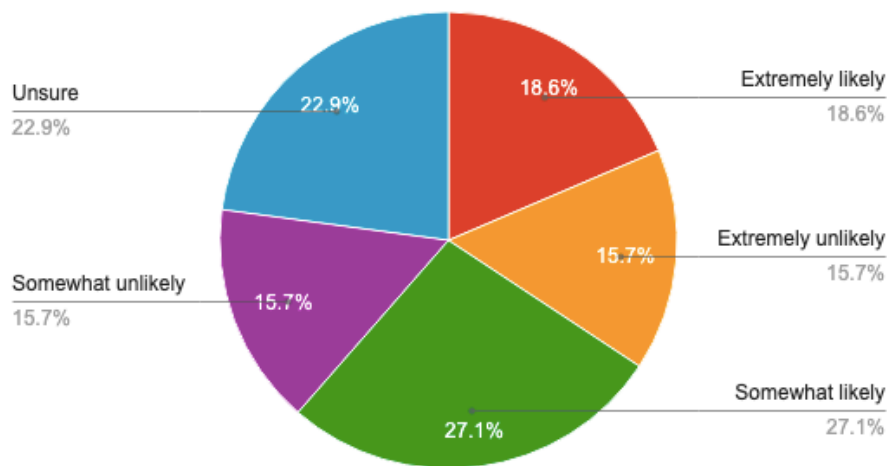
#### 4.2.5.1.3 “How likely would you buy them regularly?”

“How likely would you buy clean meat/plant-based meat regularly “? As we can see from pie charts, the majority in both cases voted for “Unsure” and “Somewhat likely” (28.2% and 32.4% for clean meat, 22.9% and 27.1% for plant-based meat). That happened because the “real” product is not yet available on the market and people have no clear understanding of the product. “Extremely likely” variants scored 14.1% for clean meat and 18.6% for plant-based meat. The rates are relatively low because of the reason stated above – people cannot be certain about buying product regularly if they do not know the product for sure.



**Figure 37. How likely would you buy clean meat regularly?**

Source: (Authors own work; Google Forms; Awesome Gapps , 2021)



**Figure 38. How likely would you buy plant-based meat regularly?**  
 Source: (Authors own work; Google Forms; Awesome Gapps , 2021)

## 5 Conclusion

The comprehensive literature review shows us that factory farming is proved to have some ethical issues and negative consequences. Pollution, tough working conditions, risk of meat and air contamination – these are all proved issues of factory farming. But if we consider “animal welfare” term explained before and associate it with all these ethical issues, we can see the connection between animal welfare and all these risks above. Taking into consideration animal welfare is essential in factory farming because when it is neglected, these risks actually appear. Tight raising conditions increase risk of contamination, use of antibiotics. Use of antibiotics decreases safety of food because such meat can contain residuals of chemicals, risk of antimicrobial resistance also increases. Refraining animal natural behavior increases their stress – therefore, as stated before, animals can become aggressive and bite each other or workers – that can lead to injuries risk and again, risk of contamination. We can make these connections with any ethical issue stated above, but the main idea is clear – animal welfare is the starting point of these ethical issues’ emergence. Improving livestock raising conditions, popularizing alternative productions of meat is not only “good” for animals, but for all of us, for the environment. Therefore, goals of government (e.g., European Union program “Farm to Fork”), reduced use of antibiotics, emergence of innovations in meat production show us that these ethical issues are generally acknowledged and are steadily being solved. The goals for today remain the same: to propose better raising conditions for animals, to reduce chemical use in farming, to lower their environmental impact.

Moreover, in order to achieve goals more effective, it is vital to inform consumers about origins of meat products (how meat is made) factory farming, alternative ways of production. Food

and nutrition education should be more widespread (e.g., in schools). That way consumers can make more deliberate choices when buying meat. Before, I have said that young generation might have misconceptions about factory farming because of the information available in modern medias. Based on the survey results we can see that for most of the young people, some factory farming impacts remain unknown. The majority of participants do not hold strong opinions about ethics, healthiness or nutritional value of the products, therefore there is no particular “trust” to factory meat. Despite this fact, meat remains a significant part of the participants’ life, it is not irreplaceable for most of them. Most of the participants see no difficulties in switching to alternatives to conventional meat, they are not certain about conventional meat, but they are susceptible towards new information and proposed alternatives. Therefore, as I have said before, there is no particular trust and love towards factory farm products – they are more perceived as “given” and easily available. Therefore, if food and nutrition education are proposed by governmental programs, if companies improve producing conditions and tell customers how this meat was made, and if alternatives are proposed and available to general public, that can lead to improvements to all ethical issues stated above.



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## 7 Appendix

### 1) What is your current gender identity?

- Male
- Female
- Prefer not to say

### 2) What is your age?

- Under 18
- 18-24
- 25-34
- 35-44
- 45-54
- Above 54

### 3) What is your highest level of completed education?

- Primary school
- Some high school
- Completed high school
- Technical qualification or trade certificate
- College/Undergraduate degree
- Postgraduate degree

**4) Would you say you live in a...?**

- Rural area or village
- Small or middle-sized town
- Large town or city

**5) Which of the following do you eat at least occasionally?**

- Beef
- Pork (bacon, ham, ribs)
- Mutton (lamb, goat)
- Poultry (chicken, turkey, duck)
- Fish or shellfish (tuna, lobster, shrimp, oysters)
- Dairy products (milk, yogurt, cheese, ice cream, butter)
- Eggs
- I never eat any of the above

**6) On average, how many meals with meat per week do you consume?**

For breakfast	0	1	2	3	4	more
For lunch						
For dinner						

**7) To what extent do you agree or disagree with the following statements?**

- Strongly disagree (1)
- Somewhat disagree (2)
- Neutral (3)
- Somewhat agree (4)
- Strongly agree (5)

I am concerned about animal welfare

Meat is one of the pleasures in my life

Meat is irreplaceable in my diet

I feel bad when I think of eating meat

I love meals with meat

To eat meat is disrespectful towards life and the environment

To eat meat is right of every person

If I did not eat meat, I would feel weak

Meat reminds me of diseases

By eating meat, I am reminded of animals' suffering and death

I do not picture myself without regular meat-eating

I would feel fine with meatless diet

**8) Conventional meat is**

- Strongly disagree (1)
- Somewhat disagree (2)
- Neutral (3)
- Somewhat agree (4)
- Strongly agree (5)

Healthy

Natural

Impacting the environment

Ethical

Tasty

Safe

Expensive

Good for animals

Sustainable

Nutritious

Necessary

**9) Have you heard of term "clean meat"?**

- Yes, I have
- No, I have not
- Unsure

**10) Imagine that clean meat has become widely available at grocery stores, restaurants, butchers, and markets. How likely would you try it?**

- Extremely unlikely
- Somewhat unlikely
- Neutral
- Somewhat likely
- Extremely likely



**11) How likely you would...**

Purchase clean meat regularly

Eat clean meat as a replacement for usual meat

Pay higher price for clean meat than usual meat

- Extremely unlikely
- Somewhat unlikely
- Unsure
- Somewhat likely
- Extremely likely

**12) Have you heard of term "plant based meat"?**

- Yes, I have
- No, I have not
- Unsure

**13) Imagine that plant-based meat has become widely available at grocery stores, restaurants, butchers, and markets. How likely would you try it?**

- Extremely unlikely
- Somewhat unlikely
- Neutral
- Somewhat likely
- Extremely likely

**14) How likely you would...**

Purchase plant-based regularly

Eat plant-based meat as a replacement for usual meat

Pay higher price for plant-based meat than usual meat

- Extremely unlikely
- Somewhat unlikely
- Unsure
- Somewhat likely
- Extremely likely