



Levegő Munkacsoport

Reducing methane emissions by cutting dairy and meat consumption in Hungary – opportunities and proposals

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1 EXECUTIVE SUMMARY

This study provides a comprehensive picture of how methane emissions from agriculture could be reduced in Hungary by reducing the consumption of meat and dairy products. It analyses in detail the current consumption habits, the state aid system, and presents a number of potential interventions and their expected effects.

The starting point of the study is that food consumption – especially the consumption of meat and dairy products – is a substantial environmental burden in Hungary, accounting for about 40% of the environmental footprint. Within this, pork and dairy products are the largest emitters. High meat and dairy consumption also raises health and animal welfare problems. The current level of consumption substantially exceeds not only the progressive international but also the domestic dietary recommendations. Hungarians consume eight times as much beef and pork, and twice as much chicken, milk and dairy products as recommended by authoritative experts.

The main reason for the high consumption of meat and dairy, which has increased greatly in recent decades, is the huge direct and indirect subsidies provided to the sectors concerned, in addition to the increase in the income of the population. In addition, consumption is further increased by the substantial sums spent on communication to encourage the consumption of these products, while only a fraction of this amount has been spent on promoting healthy eating.

The current agricultural subsidy system is also worrying from the point of view of social justice: those with higher incomes receive much more subsidies than those with low incomes, which is another reason why it needs to be transformed.

The study identifies thirteen potential interventions aimed at reducing meat and dairy consumption, primarily not by banning, but by influencing consumer decisions. The seven options of interventions for the government include:

- reallocation of agricultural subsidies,
- reducing industrial use of meat and dairy products,
- the reform of the value-added tax system,
- additional taxation of meat and dairy products,
- improving consumer information (e.g. by introducing mandatory sustainability labelling),
- the elimination of state advertising and marketing subsidies to encourage the consumption of meat and dairy products, and
- the restructuring of the school milk scheme.

The study identifies six options of interventions for companies that take sustainability goals seriously and are willing to take action:

- the use of various behavioural economic insights to transform consumer habits,
- more favourable pricing of plant-based products and reduced profit margin on these products,
- the transformation of recipes in order to replace ingredients of animal origin,
- the reconsideration of recommendations for use and recipes from a sustainability perspective,
- the introduction of voluntary sustainability labels on packaging, and
- rethinking corporate sustainability communication.

The study also draws attention to the potential risks associated with the measures, and presents examples to be followed internationally: in Denmark, an agricultural carbon tax has

been introduced, in Austria, the revenues of the carbon tax are returned to the population, while in the Netherlands, some municipalities have banned the advertising of meat products. These measures can also serve as inspiration for Hungarian decision-makers.

The study pays special attention to the issue of social acceptance. Measures with direct financial impacts (e.g. taxes) are often met with resistance, while interventions that are indirect and built on positive messages (e.g. emphasising health benefits) may enjoy greater support. Communication strategies are crucial: showing the severity of climate change and pollution, emphasising the return of tax revenues, and promoting sustainable alternatives can all contribute to success.

Overall, the study offers a complex package of proposals that can be implemented on several levels, which takes into account environmental, health, social and economic aspects and realities. The goal is not only to reduce methane emissions, but also to create a fairer, more environmentally friendly and healthier food system in Hungary.

2 MEAT AND DAIRY CONSUMPTION IN HUNGARY

Food stands out among other products and services because it is essential for sustaining life. It is possible to live without a cell phone or a hairdresser, but not without food. That is why the availability and price of food are key political issues; influencing food consumption and transforming its structure is difficult in many ways and provokes substantial resistance. While, for example, reducing the consumption of single-use goods is generally accepted in society for sustainability reasons, many people question even the theoretical necessity of reducing meat and dairy consumption.

In contrast, reducing the current level of meat and dairy consumption would be important not only from an environmental and emissions reduction point of view, but also from a health and animal welfare perspective. At the beginning of the study, we briefly review these three areas, demonstrating and confirming that reducing meat and dairy consumption is, on the one hand, inevitable over time and, on the other hand, would also have beneficial effects.

2.1 ENVIRONMENTAL FOOTPRINT OF MEAT AND DAIRY CONSUMPTION

The European Platform on Lifecycle Assessment (EPLCA),¹ operated by the European Commission, is the official knowledge base of the European Union (EU) for the evaluation of its various sustainability initiatives and the identification of areas of intervention. The EPLCA has a focus on consumption, and its analysis is based on the products and services consumed by the average citizen, including domestically produced products and imports. (However, the environmental impact of products sold for export is not included, as it is not linked to domestic consumption.) The environmental impact of products and services was determined using life-cycle assessments.

The analysis classifies products and services into five groups: food, housing, mobility, household goods, and appliances. In each area, it examines a total of 16 indicators (climate change, ozone depletion, human toxicity – cancer, human toxicity – non-cancer, particulate matter, ionising radiation, photochemical ozone formation, acidification, terrestrial eutrophication, freshwater eutrophication, marine eutrophication, freshwater ecotoxicity, land use, water use, resource use – fossil, resource use – mineral and metals) and a combined single weighted score calculated from these values. The methodology used and the detailed results are publicly available on the Consumption Footprint Platform.²

Based on the 2023 results, 40% of the environmental impact caused by the Hungarian consumers came from food, within which the three most substantial product groups were pork (19.6%), poultry meat (16.1%) and cheese (11.7%). Beef was responsible for 3.2% of the environmental impact of food in Hungary.

In most cases, methane emission is not considered as a separate category but is included among the greenhouse gases. That is why in this study, due to the lack of available data, we write about greenhouse gas emissions. However, only part of it is methane. Based on data from Poore and Nemecek (2018), 49% of the carbon dioxide equivalent emissions associated with beef come on average from methane, compared to 46% for cheese and 17% for pork. Overall, methane accounts for about half of the carbon dioxide equivalent emissions of beef and dairy

¹ <https://eplca.jrc.ec.europa.eu/ConsumptionFootprintPlatform.html> (retrieved: 10 June 2025)

² Descriptions of each indicator and their corresponding metrics are available here: https://eplca.jrc.ec.europa.eu/uploads/FAQ_CFP.pdf (retrieved: 11 June 2025).

products, about a sixth of the emissions of pork, and negligible emissions of chicken.³ If only meat consumption is specified in general, it is worth calculating with a weighted value along with the consumption rates. Based on the (latest) consumption data for 2020 published by the Hungarian Central Statistical Office (HCSO)⁴ and the emission figures of Our World in Data, roughly 20% of the carbon dioxide equivalent emissions associated with domestic meat consumption come from methane. The reason for this is that beef consumption is quite low in Hungary (1.1 kg/capita/year on average). In the case of dairy products, the previously presented 50% value can be used. These ratios are worth considering if someone is interested in the methane emissions in relation to domestic dairy and meat consumption based on data on carbon dioxide equivalent emissions.

The role of food is also outstanding when examining greenhouse gas emissions (based on the EPLCA data): 2.04 tonnes (31.8%) of the 6.43 tonnes of carbon dioxide equivalent emissions produced by the average domestic consumer came from food. Of this, 0.92 tonnes can be linked to meat consumption and 0.39 tonnes to milk consumption, i.e. 20% of total emissions (and 64% of emissions from food) came from these two product groups. By comparison, total mobility-related emissions were responsible for 24.5% of total greenhouse gas emissions, almost as much as meat and dairy consumption alone.

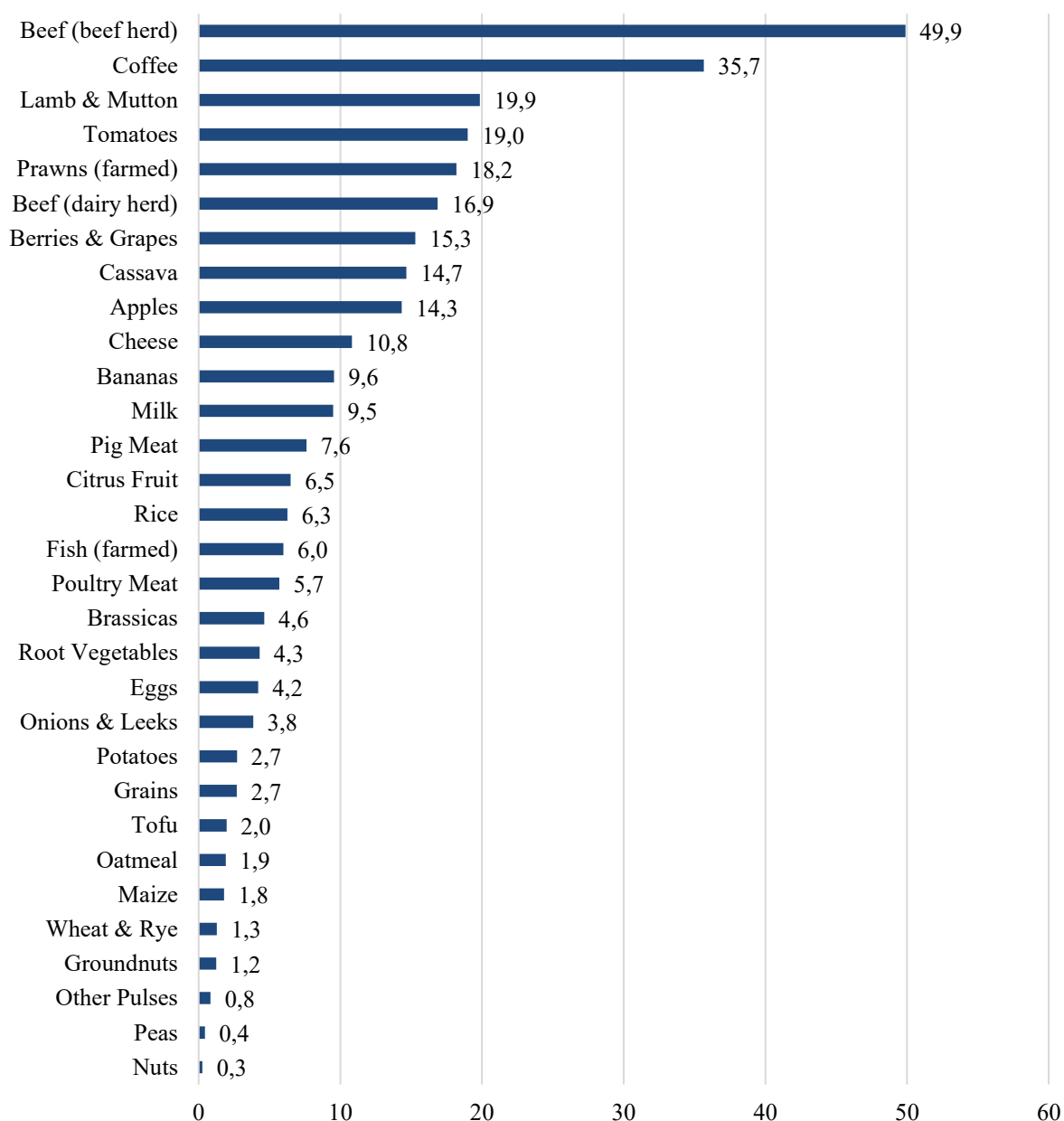
If we look at the greenhouse gas emissions per 100 g of protein instead of the weight or total consumption of food, we can get similar results (Figure 1): in the case of beef, this value is almost 50 kg (per 100 g of protein), in the case of cheese 10.8 kg, in the case of milk 9.5 kg, in the case of pork 7.6 kg, in contrast to only 1.2 kg in the case of peanuts and 0.4 kg in the case of peas, and for other legumes, it is only 0.8 kg on average.⁵

³ <https://ourworldindata.org/carbon-footprint-food-methane> (retrieved: 8 July 2025)

⁴ <https://statinfo.ksh.hu/Stainfo/QueryServlet?ha=OB1006R> (retrieved: 8 July 2025)

⁵ <https://ourworldindata.org/grapher/ghg-per-protein-poor> (retrieved: 11 June 2025)

Figure 1. Greenhouse gas emissions per 100 g of protein (kg carbon dioxide-equivalents)



Source: <https://ourworldindata.org/grapher/ghg-per-protein-poore> (retrieved: 11 June 2025)

Finally, empirical research also supports that eliminating or at least reducing meat consumption can make a substantial contribution to reducing greenhouse gas emissions. In their research, Scarborough et al. (2023) estimated the environmental footprint of different diets based on the food diaries of 55,504 people, using data from life-cycle assessments. Based on the results, the greenhouse gas emissions associated with a fully plant-based diet (vegan lifestyles) are only 25.1% (i.e. a quarter) of those who consume a lot of meat, but there is a difference of 30% even in the case of those who eat little and a lot of meat. Thus, the less animal-based food, especially meat, is in the diet, the lower its environmental footprint.

Food production, therefore, has substantial externalities, with (typically negative) effects that are not reflected in the prices of the products. However, the true social costs of food can

be quantified using the true cost accounting (TCA) methodology.⁶ Following this methodology, and considering the consumption data, the average unpaid environmental cost of pork consumption is approximately HUF 36,000 per capita per year in Hungary, HUF 10,000 per capita per year of milk consumption and HUF 7,000 per capita per year of beef consumption. If we want to incorporate this into the prices, it would increase the average price of milk by 52%, the average price of pork by 118% and the average price of beef by 157%.⁷ A related retail initiative is presented by Subchapter 6.6.

However, only a smaller portion of the external costs not reflected in the prices can be attributed to greenhouse gas emissions: 16% in the case of beef herds, 11% in the case of pork, and 22% in the case of milk. The largest part of the external costs comes from terrestrial acidification and particulate matter formation.

Recently, new types of metrics have appeared, such as the nutritional life-cycle assessment (nLCA), which also takes into account the quality (amino acid composition and digestibility) of proteins in foods. The results of this were interpreted by the meat industry lobby as “the environmental impact of meat and dairy products was almost halved, while that of plant-based products increased by almost 60%.”⁸ This is a misleading and erroneous interpretation for several reasons. On the one hand, the original study (McAuliffe et al., 2023) clearly shows that even after these adjustments, the greenhouse gas emissions of the tested animal-based foods per 100 g of protein are significantly higher than those of the tested plant-based foods. Moreover, the 60% figure cited in the press release represents a maximum value: “[t]he largest change across plant-based products is wheat which, due to its low DIAAS score [Digestible Indispensable Amino Acid Scores], results in a 57% increase in its GWP [global warming potential] and LU [land use] impacts” (p. 150). A good example of the misleading interpretation of the meat industry lobby is tofu, where the environmental footprint has become even smaller as a result of the correction. On the other hand, the authors highlight that “food items are not consumed in isolation but as part of a diet [...]. Therefore, when analysed at the single commodity level, synergies between complementary dietary ingredients, even simple combinations thereof such as rice/veg/protein source, are ignored. This is a major flaw in many nLCA” (p. 152). Therefore, instead of analysing a product in isolation, the environmental effects calculated based on people’s real eating habits are more reliable. And such studies (e.g. Scarborough et al., 2023) clearly demonstrate that eliminating animal-based products has the potential to substantially reduce greenhouse gas emissions.

However, the current situation will continue to deteriorate if we do nothing. According to the analysis of Kozicka et al. (2023), if we do not replace some of the animal-based products with plant-based alternatives, greenhouse gas emissions related to agriculture will increase by 15% by 2050. And to achieve a 30% reduction in greenhouse gas emissions, half of the food of animal origin will have to be replaced with plant-based alternatives; out of these, the substitution of beef is particularly important.

⁶ For more details on this, see the studies by de Adelhart Toorop et al. (2023) and Lord (2024).

⁷ <https://www.vego.hu/sites/default/files/Internalization-of-Externalities-of-Animal-Derived-Products-in-Hungary-20250721-Final.pdf> (retrieved: 29 July 2025)

⁸ <https://meatthefacts.eu/home/activity/beyond-the-headlines/nlca-the-environmental-impact-of-meat-and-dairy-is-half-of-what-is-calculated-so-far/> (retrieved: 11 October 2025)

2.2 HEALTH EFFECTS OF MEAT AND DAIRY CONSUMPTION

The most frequently cited argument against reducing meat and dairy consumption is that, as opposed to air travel, for example, these products are necessary for a healthy life, so reducing their consumption is associated with significant health risks (Gundersen et al., 2025).

At this point, we do not want to enter the debate about the beneficial or unfavourable health effects of completely eliminating meat and dairy products from the diet (i.e. vegan or plant-based diets), but we only point out that according to the world’s leading dietetic societies, a plant-based diet can be satisfactory and appropriate at all ages and life situations.⁹

However, reducing current levels of meat and dairy consumption does not necessarily mean giving them up entirely. The Planetary Health Diet, a diet optimal for human health and environmental sustainability, recommended by the EAT–Lancet Committee includes 250 g of milk, 15 g of beef, pork, or lamb and 30 g of chicken and other poultry per day.¹⁰ In comparison, based on current consumption data in Hungary, we consume more than twice as many dairy products and more than four times as much meat per day, while we consume about half as many vegetables and fruits as recommended and a negligible amount of legumes (Table 1).

Table 1. Comparison of domestic food consumption with different international recommendations (g/capita/day)

Product Category	Domestic consumption, 2020	EAT–Lancet Recommendation	GBD 2021 Recommendation
Grains	267	232	160–210
Tubers or starchy roots	75	50	-
Vegetables	163	300	306–372
Fruits	124	200	340–350
Dairy products (milk equivalent)	532	250	280–610
Beef, pork, lamb	119	14	0–200
Poultry meat	69	29	-
Eggs	27	13	-
Fish	7	28	-
Legumes	2	75	100–110
Nuts and seeds	4	50	19–24
Oils and fats	48	52	-
Added sugar	34	31	-

Source: based on data from the HCSO (https://www.ksh.hu/stadat_files/jov/en/jov0026.html, retrieved: 10 May 2025), Rockström et al. (2025), Table 1, GBD 2021 Risk Factors Collaborators (2024) Supplementary appendix 1, Table 1 (p. 170–172).

It is worth comparing the current consumption data in Hungary with the results of the Global Burden of Diseases, Injuries, and Risk Factors Study (GBD).¹¹ GBD is the largest and

⁹ <https://albertschweitzerfoundation.org/news/vegan-diet-healthy-across-all-stages-of-life-cycle> or <https://www.bda.uk.com/resource/vegetarian-vegan-plant-based-diet.html> (retrieved: 10 June 2025)

¹⁰ The first recommendation published in 2019 (<https://eatforum.org/eat-lancet-commission/eat-lancet-commission-summary-report/>, retrieved: June 10, 2025) essentially repeated the second recommendation issued in 2025 (Rockström et al., 2025).

¹¹ Research website: <https://www.healthdata.org/research-analysis/gbd> (retrieved: 10 June 2025).

most complex public health research to date, coordinated by the University of Washington. Based on the results of the public health risk factors analysis of the 2021 GBD data (GBD 2021 Risk Factors Collaborators, 2024), excessive consumption of red meat, processed meat, and dairy causes important health problems: prostate cancer, colon cancer, type 2 diabetes, ischemic heart disease, breast cancer. The daily consumption values recommended by the study can also be seen in Table 1. In all cases, these are quite wide intervals. In the case of milk and meat consumption, the average domestic consumption values fall within the recommended interval, but there is also room for their reduction, as the values are quite far from the bottom of the intervals. In addition, the average values mask individual differences. Average consumption can also be reduced if the consumption of those who consume the most decreases, for example, those who currently consume more meat and dairy products than the recommended upper limit. For them, this would clearly have a positive health impact.

On the other hand, in the case of vegetables, fruits, nuts and seeds, and legumes, the current domestic consumption levels are substantially lower even than the lower limit of the recommended consumption ranges. This also confirms that there would be plenty of room to encourage the consumption of vegetables, fruits and legumes in Hungary.

According to the analysis of Móznér Vetőné and Szűcs (2024), if the Hungarian population followed the dietary recommendation of the Hungarian Dietetic Association, the Smart Plate (“Okostányér”), the ecological footprint associated with eating would be reduced by 19%. The difference is mainly caused by meat, meat products and fats, which the Hungarian population consumes significantly more of than recommended (while much less of vegetables and fruits). It is true for each income decile that their meat consumption is higher compared to the recommendation.

2.3 MEAT AND DAIRY CONSUMPTION FROM AN ANIMAL WELFARE PERSPECTIVE

At the beginning of this study, we would also like to briefly mention that, in addition to sustainability and health considerations, we must not overlook animal welfare considerations. At present, approximately 80,000–110,000 cattle, 4–5 million pigs, 40,000–50,000 sheep and 200–240 million poultry are slaughtered annually in Hungary.¹² Almost the entire amount of meat and dairy products consumed comes from industrial livestock farms. Peter Singer, professor emeritus of Princeton University, writes in his article in the Guardian¹³ that “[a]mong philosophers who discuss the ethics of our treatment of animals there is a remarkable degree of consensus that factory farming violates basic ethical principles that extend beyond the boundary of our own species. Even a staunch conservative such as Roger Scruton, who vigorously defended hunting foxes with hounds, has written that a true morality of animal welfare ought to begin from the premise that factory farming is wrong.”

Reducing meat and dairy consumption would therefore be of paramount importance from an ethical point of view. In this regard, it is worth referring to the Eurobarometer survey on animal welfare in spring 2023.¹⁴ The main results are as follows:

¹² <https://adat.aki.gov.hu/Diagram/ASIR/VagohidakEloallatVagasa?topmenucode=%2fAgazati%2fAllattenyeszt es&code=%2fDiagram%2fASIR%2fVagohidakEloallatVagasa&menuitemid=8f4e79d5-6cfe-434e-af5d-23c96c15449d&Lang=En> (retrieved: 9 September 2025)

¹³ <https://www.theguardian.com/commentisfree/2013/aug/05/worlds-first-cruelty-free-hamburger> (retrieved: 10 June 2025)

¹⁴ <https://europa.eu/eurobarometer/surveys/detail/2996> (retrieved: 10 June 2025)

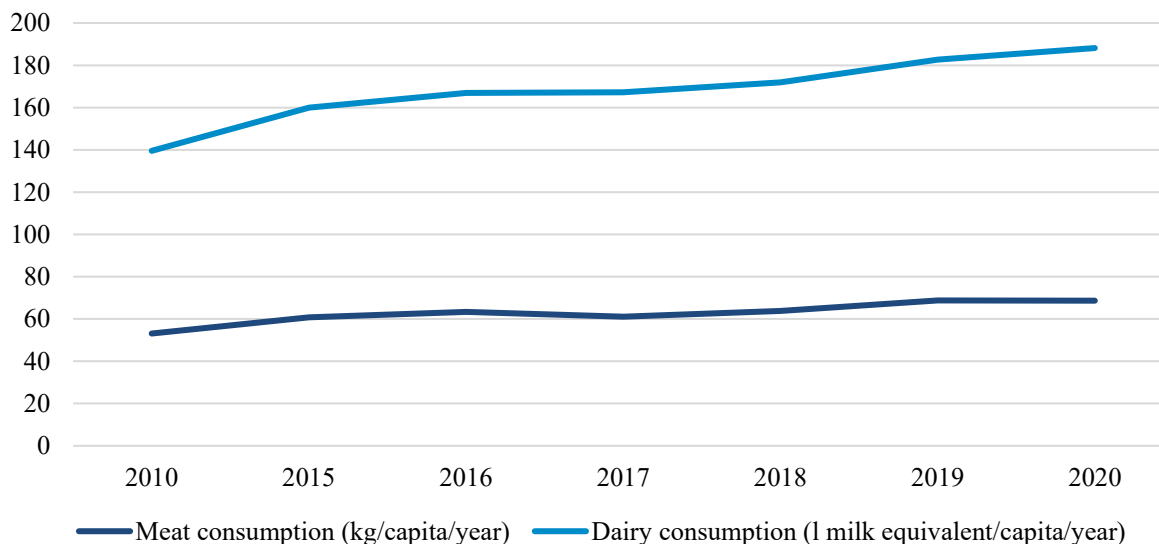
- According to 46% of domestic consumers, the protection of the welfare of farmed animals is very important, while 44% think it is somewhat important.
- 46% of domestic consumers would like to know more information about the conditions in which farmed animals are raised.
- 79% of domestic consumers believe that the welfare of farmed animals should be better protected than it is now.
- 43% of domestic consumers would be willing to pay more for products sourced from animal welfare-friendly farming systems.
- 49% of domestic consumers usually or occasionally look for labels that indicate that a product is sourced from animal welfare-friendly farming systems.

Animal welfare aspects are, therefore, also important for a substantial part of domestic consumers, who would like to know more about how and under what conditions their food is produced. However, the transition to more ethical, free-range livestock farming methods is not conceivable without reducing consumption. This is clearly demonstrated by the fact that professional organisations expected a substantial decline in production if the European Food Safety Authority’s animal welfare recommendations were followed.¹⁵

2.4 DOMESTIC CONSUMPTION TRENDS

According to the data of the HCSO, between 2010 and 2020 (the latest available data), per capita meat consumption increased by 29% and per capita milk consumption increased by 35% (Figure 2). This shows that the increase in income has also been partly reflected in the increase in consumption of these two product groups, which is rather unfavourable from a sustainability point of view. The reduction in the value added tax (VAT) on meat and dairy products, which was implemented in several stages, may also have played a role in the increase in consumption.

Figure 2. Per capita consumption of meat and dairy products in Hungary



Note: 1 kg of cheese is equivalent to 10 litres of milk, 1 kg of butter is equivalent to 20 litres of milk.

Source: based on HCSO data (https://www.ksh.hu/stadat_files/jov/en/jov0026.html, retrieved: 20 May 2025).

¹⁵ <https://www.nak.hu/sajto/sajtokozlemenyek/105495-a-csirke-es-a-tojastermelest-is-ellehetetlenitene-az-uj-unios-javaslat> (in Hungarian only, retrieved: 30 July 2025).

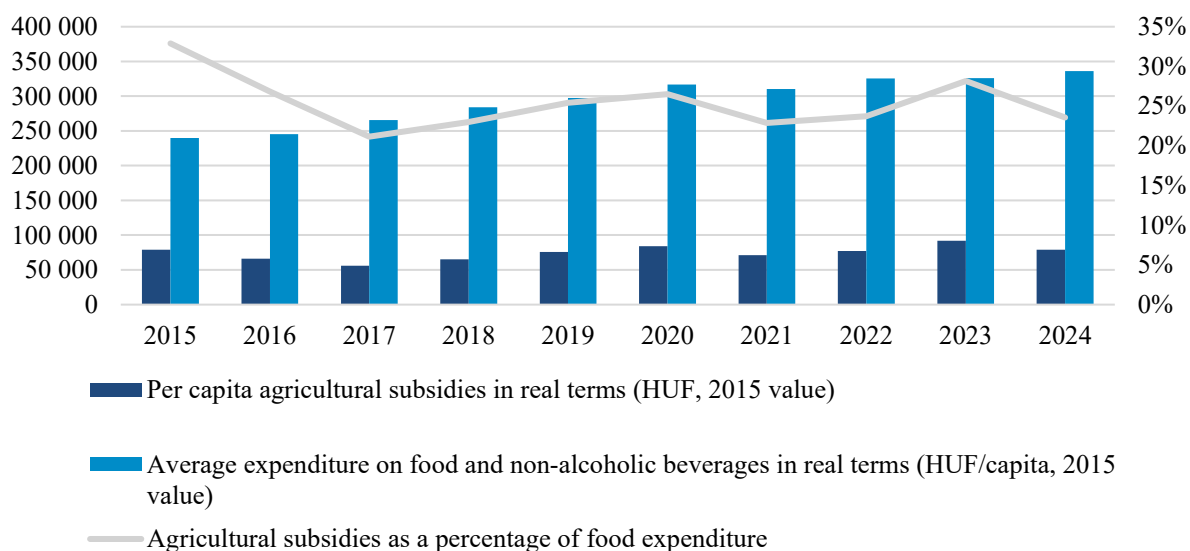
Based on the product balances¹⁶ available for the years after 2020, consumption appears to be stagnating, with no substantial further growth between 2020 and 2023, but consumption did not decline during this period either.

¹⁶ https://www.ksh.hu/stadat_files/mez/en/mez0048.html,
https://www.ksh.hu/stadat_files/mez/en/mez0049.html, https://www.ksh.hu/stadat_files/mez/en/mez0054.html,
https://www.ksh.hu/stadat_files/mez/en/mez0056.html (retrieved: 30 July 2025)

3 CURRENT DIRECT AND INDIRECT STATE SUBSIDIES FOR THE MEAT AND DAIRY INDUSTRIES AND THEIR SIGNIFICANCE

Agricultural production receives substantial state subsidies in Hungary. According to data published by the Institute of Agricultural Economics (AKI) in the Financial Newsletter,¹⁷ HUF 1,256.4 billion was paid out in agricultural and rural development subsidies in 2024. This means HUF 131,000 per capita, i.e. nearly a quarter of the per capita food expenditure. Based on the data of previous years, a continuous increase in agricultural subsidies can be observed in the long run, although in real terms this increase disappears, so subsidies have essentially increased at the rate following inflation (Figure 3).

Figure 3. Agricultural subsidies paid in the given year and the development of food expenditure in Hungary in real terms



Note: the annual per capita expenditure on food and non-alcoholic beverages is only available on the website of the HCSO until 2020, and for the following years, we have calculated using the change in the retail sales of food, non-alcoholic beverages and coffee. The consumer price index was used to calculate the real values.

Source: own calculation based on AKI Financial Newsletters (<https://www.aki.gov.hu/product-category/penzugyi-hirlevel/>, retrieved: 20 May 2025) and HCSO data (https://www.ksh.hu/stadat_files/nep/en/nep0001.html, https://www.ksh.hu/stadat_files/bel/en/bel0005.html, https://www.ksh.hu/stadat_files/jov/en/jov0025.html and https://www.ksh.hu/stadat_files/ara/en/ara0001.html, retrieved: 20 May 2025).

In this chapter, we review the origins of these subsidies, the agricultural activities they support, their impact on farmers' incomes and their fairness from a social perspective.

3.1 SOURCES OF AGRICULTURAL SUBSIDIES

Domestic agricultural subsidies basically come from two sources. On the one hand, from the EU's Common Agricultural Policy (CAP), and on the other hand, from the supplementary national funding. While between 2015 and 2022 the distribution between EU and domestic

¹⁷ AKI Financial Newsletter, Vol. XVIII, No. 1 (<https://www.aki.gov.hu/termek/penzugyi-hirlevel-60/>, retrieved: 10 June 2025)

funds was 80% to 20%, in 2023 and 2024 the proportion of EU funds decreased to 62–64%, mainly due to the increase in the level of subsidies financed from the domestic budget.¹⁸

The CAP is one of the most important EU policies, accounting for a quarter of the EU budget.¹⁹ In the case of the CAP, long-term objectives are agreed between the European Commission, the Council of the European Union and the European Parliament, for the implementation of which strategic plans are drawn up at the national level. These plans are approved by the Commission on the basis of compliance with the objectives. The CAP currently in force covers the period 2023–2027. Each Member State had to develop its own strategic plans along the strategic objectives adopted for this period. This includes the programmes, measures and subsidies with which each Member State intends to contribute to the achievement of the CAP objectives formulated at the EU level.

The resources of the CAP are supplemented by other subsidies financed from the national budget, the amount of which is very substantial in Hungary in the current CAP period.

3.2 USE OF AGRICULTURAL SUBSIDIES

The CAP for the period 2023–2027 focuses on the achievement of ten specific objectives. The ninth of these (“Responding to societal demands on food & health”) aims to develop healthy, sustainable agriculture and food production that reflects social needs.²⁰ This would include promoting healthier and more sustainable diets, which are more plant-based. In its comments on the first version of the Hungarian CAP Strategic Plan, the European Commission highlights that “[w]hile the Plan acknowledges the need to increase awareness of healthy diets, interventions proposed seem to be limited. The Commission therefore invites Hungary to better explain how the shift towards healthy, more plant-based and sustainable diets will be achieved.” (Observations on the proposal by Hungary for a CAP Strategic Plan 2023–2027,²¹ paragraph 102).

Despite this, the adopted national CAP strategy did not include a specific plan to support and promote the spread of plant-based diets; the plan only notes that “[t]here is a growing social demand for products that meet specific dietary requirements, and demand is increasing accordingly. In response to social demands, we plan to meet specific needs by adding value to agricultural products (RD04a-b) and supporting producer organisations in the fruit and vegetable sector (SC28).” (CAP Strategic Plan,²² p. 210, own translation).

Thus, among the current domestic agricultural and rural development plans, the goal is to maintain the current production structure (in which about 60% of farms also carry out livestock farming²³), and from the consumer side, there is no plan for any program that would promote a plant-based diet or food. As plant-based meat and milk alternatives are typically

¹⁸ The Hungarian government set the rate of national co-financing at the maximum level of 80% in Government Decision No. 1003/2021. (I.11).

¹⁹ <https://www.consilium.europa.eu/en/policies/the-common-agricultural-policy-explained/> (retrieved: 10 June 2025)

²⁰ https://agriculture.ec.europa.eu/common-agricultural-policy/cap-overview/cap-glance/key-policy-objectives-cap-2023-27_en (retrieved: 10 June 2025)

²¹ https://agriculture.ec.europa.eu/document/download/9b637707-1b0c-46ca-9afe-762cc5fb833f_en (retrieved: 10 June 2025)

²² <https://kap.gov.hu/sites/default/files/inline-files/Magyarorsz%C3%A1g%20KAP%20Strat%C3%A9giai%20Terve%205.1.pdf> (in Hungarian only, retrieved: 10 June 2025)

²³ https://agriculture.ec.europa.eu/document/download/98026bcc-711c-465f-9db2-1ff3d615f5b9_en (retrieved: 10 June 2025)

products with a higher level of processing, it is possible to apply for subsidies for the development and production of such products as a way to add value to agricultural products. However, this tender framework was not specifically announced for these products either, so the applicants will probably have to face substantial competition from the producers of other products as well.

Based on the above, it is not surprising that the vast majority of agricultural subsidies are received by arable crop production (HUF 494.8 billion in 2024) and livestock farming (HUF 233.6 billion in 2024) every year, while the subsidy for the horticultural sector (HUF 55.6 billion in 2024) is negligible in comparison.²⁴ In addition, a substantial part of the subsidies does not specifically support a specific sector (e.g. young farmer subsidies, subsidies for energy efficiency investments), so the actual amount of subsidies paid to livestock farmers is even higher.

In 2024, a third of the subsidies received directly by livestock farmers were dedicated to cattle breeders, and three-quarters of this was received by dairy farmers. The second largest amount of subsidies was received by pig farmers. In addition, some subsidies were not specifically linked to specific animal species, but were used for development, animal health, breeding organisation and gene conservation purposes; cattle and pig farmers also received a substantial amount of these subsidies.

Since livestock farming in Hungary is basically barn-based, it has a substantial feed requirement, so a substantial part of the subsidies aimed at arable crop production indirectly support livestock farming through more affordable feeds. To estimate this, we quantify the share of Hungary's utilised agricultural area occupied by fodder production. According to Eurostat data,²⁵ 82% of all utilised agricultural land in Hungary is arable land, of which 10% was used specifically for fodder crops in 2020; however, of cereals accounting for 58%, there was also substantial use for animal feed: in 2023, 37% of maize, 17% of wheat, 33% of barley, 64% of rye, 84% of oats and 76% of triticale were used as feed. Weighted by the harvested area, about 30% of the total grain produced was used as feed.²⁶ In addition, 15% of the utilised agricultural area is permanent grassland, which is used for hay production or animal grazing. The remaining 3% of the utilised agricultural area is mainly made up of fruit and berry trees, bushes, vineyards and olive trees, which are not used for animal feed production. Based on these, fodder crops were grown on about 40% of the utilised agricultural area in Hungary. Thus, about 40% of the subsidies allocated to arable crop production indirectly supported livestock farming, which meant an additional approximately HUF 200 billion in 2024. In total, livestock farming received at least HUF 434 billion in indirect and direct subsidies in 2024, which was essentially the same as in 2023.²⁷ Compared to the 2023 consumption figures,²⁸ this means that there is at least 19% subsidy for meat and dairy products.

However, this value is certainly underestimated due to the cross-sectoral subsidies that cannot be divided between agricultural activities (e.g. young farmer subsidies, subsidies for energy efficiency investments), which accounted for 37% (HUF 462 billion) of total

²⁴ AKI Financial Newsletter, Vol. XVIII, No. 1 (<https://www.aki.gov.hu/termek/penzugyi-hirlevel-60/>, retrieved: 10 June 2025)

²⁵ https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Agri-environmental_indicator_-_cropping_patterns (retrieved: 10 June 2025)

²⁶ Based on HCSO data (https://www.ksh.hu/stadat_files/mez/en/mez0021.html, retrieved: 22 July 2025).

²⁷ AKI Financial Newsletter, Vol. XVII, No. 1 (<https://www.aki.gov.hu/termek/penzugyi-hirlevel-56/>, retrieved: 30 July 2025)

²⁸ Per capita consumption expenditure of households dataset compiled on individual request by the HCSO.

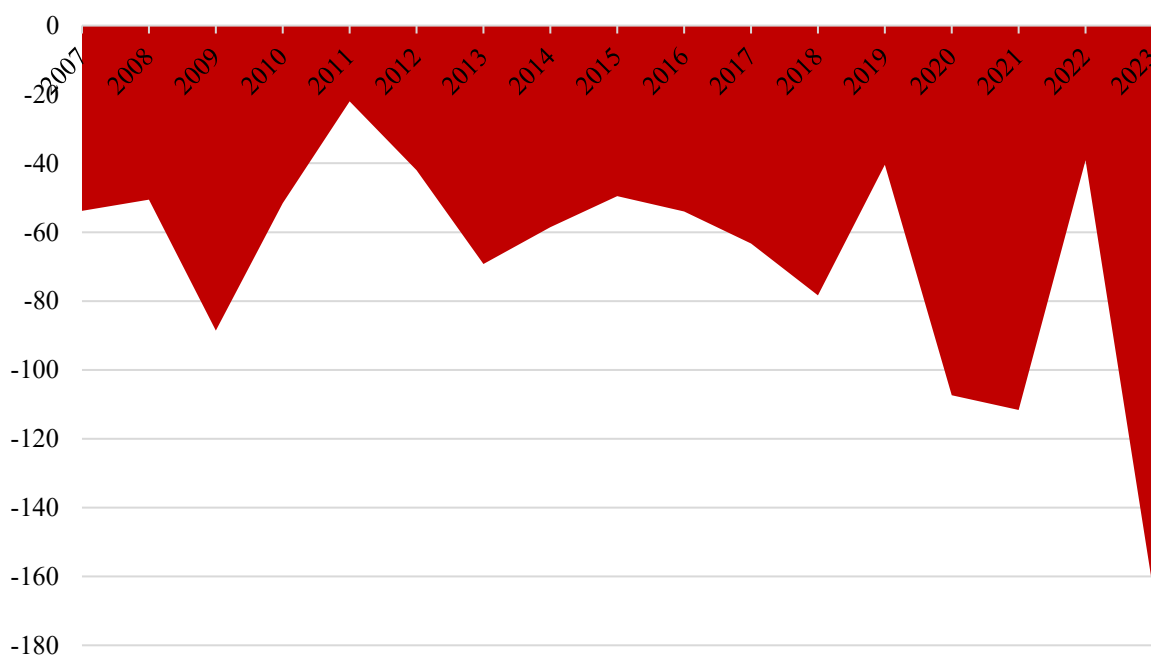
agricultural and rural development subsidies in 2024.²⁹ In addition, consumer expenditure is calculated at a gross value including VAT, while subsidies are calculated at a net value, which is also why the subsidy rate is underestimated. Overall, therefore, due to agricultural subsidies, meat and dairy products are 20–40% cheaper than the price that would be justified by production costs.

3.3 THE IMPACT OF AGRICULTURAL SUBSIDIES ON FARMERS' INCOME

Finally, it is worth examining how the income of farmers has evolved in recent years and the role of subsidies in this. AKI publishes annually the cost and income relations of each sector based on the data of the Farm Accountancy Data Network (FADN).³⁰ FADN is based on a representative data collection and provides a comprehensive and reliable picture of 95–97% of domestic agriculture. The data collection provides a detailed picture of the sources of income for farms and how their costs are changing.

The data clearly show that without subsidies, cattle and sheep rearing (Figure 4) has not been profitable in any of the years since 2007, dairy farms (Figure 5) were profitable without subsidies only in 2022, at a time of record high prices, while pig farms (Figure 6) were only profitable for some of the years, but not for the majority of the years. So not only did the state finance the entire profit of these farms, but it also had to reimburse their losses through agricultural subsidies.

Figure 4. Operating profit of cattle and sheep rearing excluding agricultural subsidies (HUF thousand/livestock unit)



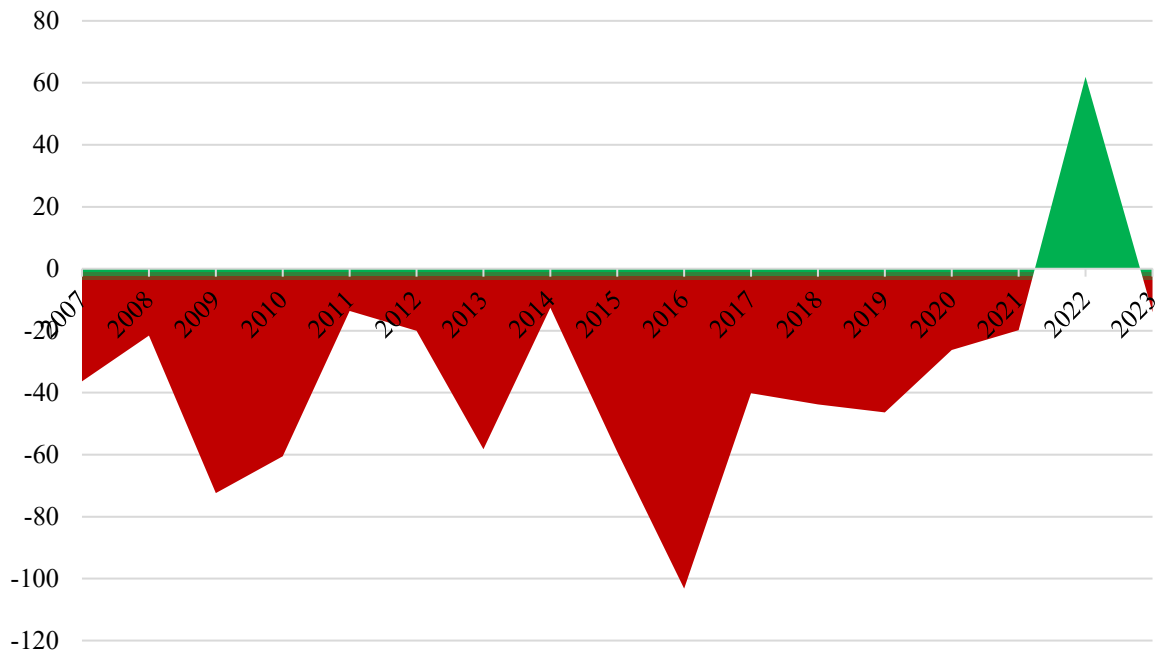
Source: own calculation based on AKI FADN data

(<https://adat.aki.gov.hu/Diagram/FADN/FadnAllattartoGazdasagEredmenyKimutatas?topmenucode=%2fAgazati%2fAllattenyesztes&code=%2fDiagram%2fFADN%2fFadnAllattartoGazdasagEredmenyKimutatas&menuitemid=c42361e8-77f0-6277-b6d6-4e074ac0ac67&Lang=En>, retrieved: 10 June 2025).

²⁹ AKI Financial Newsletter, Vol. XVIII, No. 1 (<https://www.aki.gov.hu/termek/penzugyi-hirlevel-60/>, retrieved: 10 June 2025)

³⁰ <https://www.aki.gov.hu/en/farm-accountancy-data-network-fadn/> (retrieved: 10 June 2025).

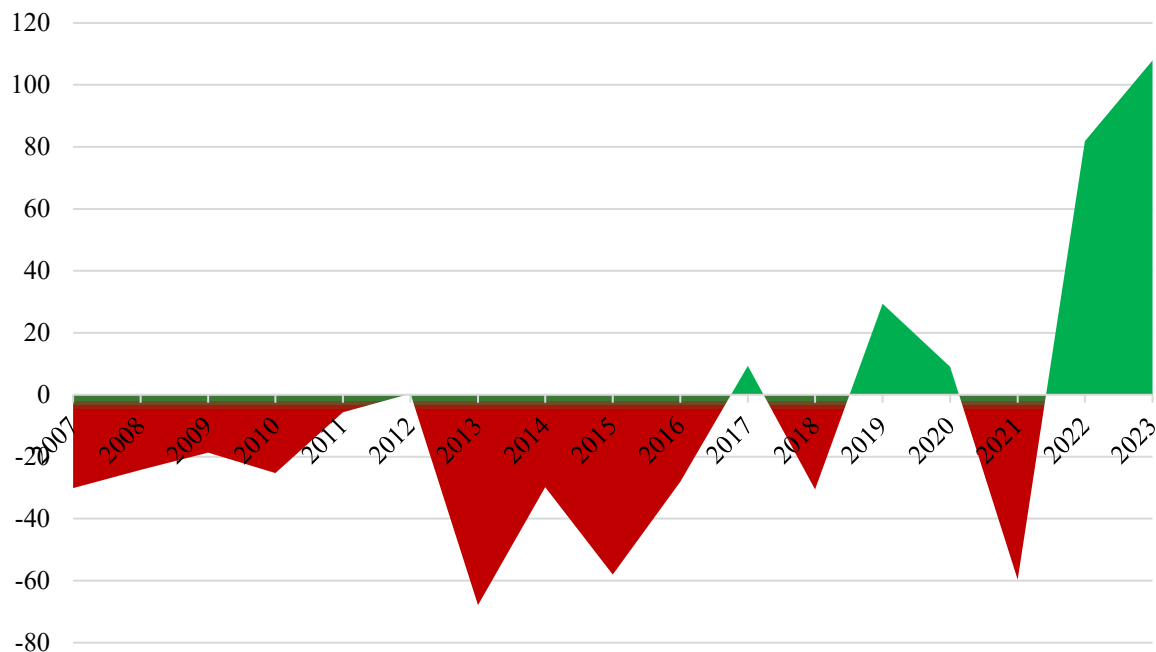
Figure 5. Operating profit of dairy farms excluding agricultural subsidies (HUF thousand/livestock unit)



Source: own calculation based on AKI FADN data

(<https://adat.aki.gov.hu/Diagram/FADN/FadnAllattartoGazdasagEredmenyKimutatas?topmenucode=%2fAgazati%2fAllattenyesztes&code=%2fDiagram%2fFADN%2fFadnAllattartoGazdasagEredmenyKimutatas&menuitemid=c42361e8-77f0-6277-b6d6-4e074ac0ac67&Lang=En>, retrieved: 10 June 2025).

Figure 6. Operating profit of pig farms excluding agricultural subsidies (HUF thousand/livestock unit)



Source: own calculation based on AKI FADN data

(<https://adat.aki.gov.hu/Diagram/FADN/FadnAllattartoGazdasagEredmenyKimutatas?topmenucode=%2fAgazati%2fAllattenyesztes&code=%2fDiagram%2fFADN%2fFadnAllattartoGazdasagEredmenyKimutatas&menuitemid=c42361e8-77f0-6277-b6d6-4e074ac0ac67&Lang=En>, retrieved: 10 June 2025).

All this suggests that cattle and pig farming do not actually create value at the national economy level (apart from one or two years), but rather consume assets. On the other hand, crop production and horticulture are profitable activities even without agricultural subsidies.³¹

Due to agricultural subsidies, meat and dairy products are artificially cheap; in essence, they are marketed much cheaper than their production costs (not taking into account externalities), which leads to overconsumption and has economically unfavourable social outcomes.

Figure 5 clearly shows that in 2022, when dairy product prices rose by a record 75% in one year,³² dairy farming became profitable even without agricultural subsidies due to the resulting additional revenue. However, by 2023, prices had started to decline (by December, they had decreased by 12% compared to the previous year), so the sector turned into a loss again. Prices covering the cost level of milk and dairy products could therefore at least approach the real production costs after such a substantial and sustained price increase. And we have not even talked about the pricing of externalities that arise during production.

3.4 SOCIAL INJUSTICE OF THE CURRENT SYSTEM OF AGRICULTURAL SUBSIDIES

In the 1960s, the CAP and the substantial subsidies for meat and dairy production were based on the social goal of European agriculture being able to provide food to the population at the right level and at the right prices. At the heart of this social goal were the poorer social strata, for whom higher food prices threatened affordability and food security, and ultimately wanted to prevent hunger.

At the same time, in the case of almost all public policies that support products in a general manner rather than specifically targeting, it is true that a larger share of the subsidies ultimately goes to the higher-income (and thus more consuming) social strata. This leads to noteworthy social injustices in Hungary in relation to subsidies for utility costs and gasoline prices.³³ A substantial part of the sums spent by the state on price subsidies goes to the richer social strata, and the primary beneficiaries of price-suppressing regulations (e.g. price caps) are also the richer ones.³⁴

A similar problem arises in the field of agricultural subsidies. People with higher incomes not only consume better quality (more expensive) food, but also consume more, and this is also true for meat and dairy products (Figure 7). Of beef and veal, which are particularly polluting in terms of methane emissions, the 10th income decile consumed 134% more in 2020 than the 1st income decile, while beef production is heavily subsidised. Figure 4 clearly shows that farmers would have incurred losses without agricultural subsidies, and that in 2024, one-third of direct livestock subsidies went to cattle farmers (a smaller portion went to beef cattle farmers, while the majority went to dairy farmers), partly to offset these losses.

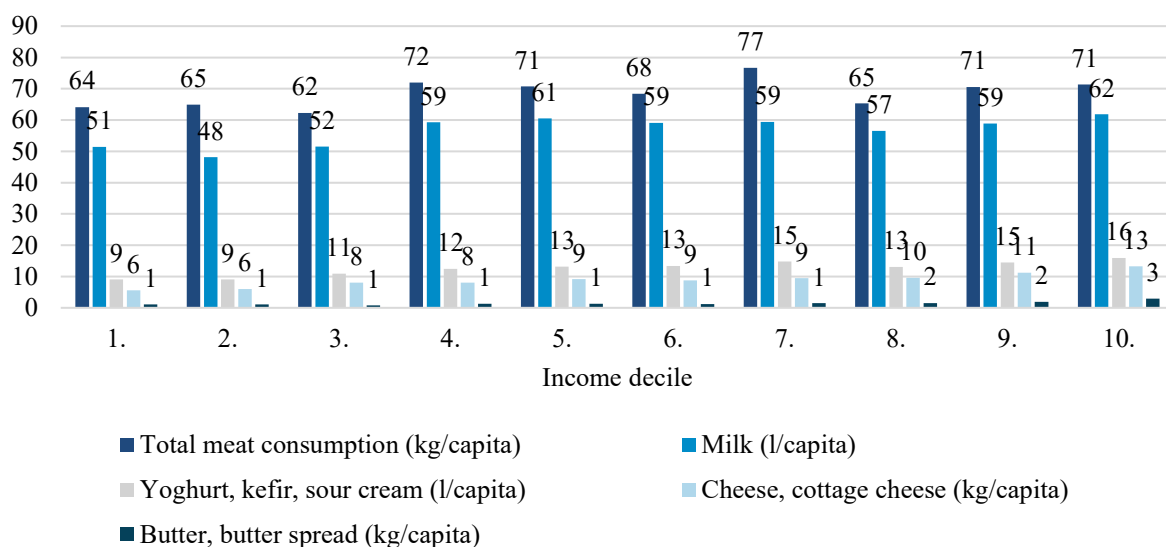
³¹ For more details, see: <https://masfelfok.hu/2023/12/20/sokkal-dragabb-hus-tej-sertes-marha-baromfi-zoldseg-gyumlcs-gazdasag-allami-tamogatasbol-klimavaltozas/> (in Hungarian only, retrieved: 10 June 2025).

³² https://www.ksh.hu/stadat_files/ara/en/ara0073.html (retrieved: 10 June 2025)

³³ https://levegomunkacsoport.blog.hu/2022/08/31/negyvenegyszeresen_elhibazott_az_uzemanyagok_arrogzites_e (in Hungarian only, retrieved: 18 June 2025)

³⁴ <https://g7.hu/elet/20250320/ne-tamogassuk-tovabb-a-gazdagokat/> (in Hungarian only, retrieved: 10 June 2025)

Figure 7. Annual meat and dairy consumption volume per capita by income deciles, 2020



Source: https://www.ksh.hu/stadat_files/jov/en/jov0026.html (retrieved: 10 June 2025)

The situation is similar with dairy products: with members of the 10th income decile consuming 20% more milk, 76% more yoghurt, kefir, and sour cream, 136% more cheese and cottage cheese, and 170% more butter and butter spread on average than members of the 1st income decile in 2020. The production of these products is also unprofitable (Figure 5), only seems to be profitable because of the substantial state subsidies.

In the field of agricultural subsidies, it is also clear that substantial subsidies are allocated to products that are consumed in substantially larger quantities by richer citizens, so richer people indirectly receive more subsidies than poorer ones. Based on their consumption of dairy products, the top income decile receives roughly twice as many subsidies as the lowest income decile. In the case of meat, the difference is slightly smaller. The agricultural subsidy system thus leads to a very unfair social distribution and also increases social inequalities.

In contrast, if the state were to give the amount spent on agricultural subsidies to citizens as a lump sum (and equal per capita) transfer, it would be the poorer deciles of society that would benefit, as they would receive more money from the additional income than they would have to pay for the increase in food prices.

The fact that agricultural subsidies increase social inequalities and injustices is, therefore, a further problem that needs to be addressed.

4 POTENTIAL INTERVENTIONS AND THEIR ESTIMATED IMPACTS

In this chapter, we present a total of 13 interventions and options for the government and corporate actors that could achieve a reduction in meat and dairy consumption, thus promoting the positive environmental, health and animal welfare impacts detailed in Chapter 2. The main feature of the identified interventions is that they build on how consumers' product choices can be shaped without being "forced" to change their consumption structure. Most of the identified areas require a restructuring of the currently very unequal situation in which public policy decisions favour meat and dairy products over other foodstuffs and artificially increase their consumption. In fact, in most cases, we would only "level" the playing field that currently favours meat and dairy products, and this alone would be able to substantially reduce greenhouse gas emissions, including methane. And if the substantial adverse environmental impacts of meat and dairy products were also taken into account, it would even be justified to tilt the path towards plant-based products.

All of the identified areas of intervention are characterised by the fact that they are not based on the coercion and discretion of consumers, but transform the factors and stimuli influencing their decisions, which also changes the optimal consumer decisions. At the same time, this can cause difficulties for consumers, and as a result, politicians and companies who oppose the interventions may become popular. The causes of consumer resistance to sustainability-related interventions and measures and ways to reduce them are discussed by Gonzalez-Arcos et al. (2021). The study is based on the basic finding that consumer behaviour is substantially influenced by social habits, and their transformation should be the primary goal. In doing so, interventions must be planned and designed in such a way that the resistance is as low as possible. The study shows this step by step. Nevertheless, in all cases, some degree of consumer resistance arises, so monitoring these and adjusting interventions may be essential, and the study also presents the related decision-making steps.

Based on this, it is clear that the introduction of measures requires proper planning and, at least in the short term, monitoring of the effects of the measures. Throughout the entire process, it is extremely important to communicate with society and to convince all stakeholders and get them interested in the change.

4.1 POTENTIAL GOVERNMENT INTERVENTIONS

In this subchapter, we present a total of seven possible government interventions that could reduce the environmental footprint (and thus methane emissions) of Hungarian consumers. In the case of the proposed interventions, we also provide a rough estimate of the greenhouse gas emission reductions they can achieve. This will make it possible to see which measure has what significance. In addition, recommendations for an appropriate communication strategy are made, taking into account the results of Gonzalez-Arcos et al. (2021). The individual potential interventions are presented along the supply chain, not prioritised based on their importance and feasibility. At the end of the subchapter, however, we summarise the individual interventions, presenting their risks and other positive impacts.

4.1.1 Reform of the agricultural subsidy system

Chapter 3 presents in detail how substantially the current domestic agricultural subsidy system favours livestock farming, while plant-based supply chains receive a much smaller amount of

subsidy. Naturally, this is also reflected in consumer prices. As a result of the subsidies, consumers of meat and dairy products do not even have to pay the real production costs, not to mention externalities.

Intervention. The reform of the agricultural subsidy system, the elimination (or substantial reduction) of direct and indirect (typically through feed production) subsidies for livestock farming, and a greater degree of subsidies for plant-based supply chains (mainly vegetables, fruits, legumes) would therefore be of paramount importance in order to transition to a more sustainable diet. At the same time, it is important to note that due to the free market within the EU, the restructuring of agricultural subsidies is primarily relevant if the subsidy system is restructured at the entire EU level; otherwise, it is possible that only cheaper imports will increase, and the intervention will have no real environmental impact. Nevertheless, it would be worth considering phasing out certain types of subsidies that fall within national competence and redistributing CAP funds. A good example of the latter is Denmark (see Subchapter 6.2).

The reform of the current agricultural subsidy system can be imagined in several ways. The main element is to eliminate (or at least substantially reduce) subsidies for meat and dairy production, but the resulting financial savings can be used in several ways:

- The freed-up funds can be redistributed to citizens as a lump sum compensation.
- The freed-up funds can be used for other social policy purposes (e.g. improving education or health care).
- The freed-up funds can be reallocated to subsidies plant-based supply chains.

A combination of these measures is, of course, also conceivable, but in many cases consumer compensation may be the key to success (see more about this in Subchapter 6.3). In addition, subsidies should be provided for agricultural producers to restructure or close their activities, as discussed in detail in Subchapter 4.1.9.

Although the system of agricultural subsidies should be fundamentally reformed at the EU level, it would also be worthwhile to adopt a plant-based protein strategy at the national level and allocate appropriate financial resources to its implementation. A similar strategy has been adopted in recent years in Denmark (see Subchapter 6.2),³⁵ Germany,³⁶ and Portugal,³⁷ while several other EU Member States actively promoted various alternative proteins in 2024.³⁸ Based on the Commission's comments on the first version of the Hungarian CAP Strategic Plan,³⁹ it is also clear that the Commission would be open to Hungary using CAP funds to subsidise the protein transition and the production of plant-based foods.

Another important problem caused by the domestic agricultural subsidy system is the monoculturalization of arable crop production and the increasing concentration of the six most widely grown crops, as pointed out by Pinke et al. (2024). In their study, they consider it a problem that the "proportion of crops most vulnerable to climate change and affected by the global agricultural raw material overproduction crisis that has unfolded in recent years has continued to grow since the system change in terms of agricultural output and agricultural land. Examining the two previous waves of modernisation in Hungarian agriculture, the study

³⁵ <https://en.fvm.dk/news-and-contact/focus-on/action-plan-on-plant-based-foods> (retrieved: 10 June 2025)

³⁶ <https://www.bmel.de/EN/topics/food-and-nutrition/food-nutrition-strategy.html> (retrieved: 10 June 2025)

³⁷ <https://proveg.org/press-release/portugal-reveals-plans-for-a-national-strategy-for-plant-based-protein/> (retrieved: 10 June 2025)

³⁸ <https://proveg.org/news/seven-countries-leading-the-way-in-plant-based-food-policies-in-2024/> (retrieved: 10 June 2025)

³⁹ https://agriculture.ec.europa.eu/document/download/9b637707-1b0c-46ca-9afe-762cc5fb833f_en?filename=observation-letter-hungary_en.pdf (retrieved: 10 June 2025)

identifies a pattern that has been repeating itself for a century and a half: modernisation efforts have resulted in an agricultural structure that ensures the production of products with low innovation needs” (p. 220). The increase in the weight of arable crop production and the slow decline in the production of vegetables and fruits with higher added value also result in problems for the domestic canning and deep-freezing industry, which threatens Hungary’s favourable export positions in this sector, as pointed out by the Hungarian Competition Authority (GVH) in its report on its 2023 accelerated sector inquiry analysing vegetable and fruit supply chains.⁴⁰

Increasing subsidies for the production of plant-based products, primarily vegetables, fruits and legumes, would therefore not only reduce the production costs of these products, but would also be able to make these supply chains attractive to farmers again. This would be able to provide the raw material base of the domestic canning and deep-freezing industry in the long term, which is an important food industry class of Hungary, with outstanding export performance, but with a decreasing production volume in recent years.⁴¹

Expected effects. Scientific research and modelling also prove that greenhouse gas emissions can be measurably reduced by restructuring the subsidy system. Abadie et al. (2016) use Norwegian data to model what a tax and subsidy system would look like that, in addition to containing the same number of calories on average as the current diet, contributes to the reduction of greenhouse gas emissions and takes into account other health factors. Based on its findings, taxes should be increased for all food categories except vegetables, fruits, poultry, fish, eggs and drinking milk, which could reduce food-related greenhouse gas emissions by up to 10%. To reduce emissions, the consumption of ruminant meat and cheese would have to be reduced in the first place by 49% and 28%, respectively.

Edjabou and Smed (2013) carried out similar modelling on Danish data, in which they examined the effects on consumption of taxes resulting in prices that internalise the carbon-equivalent emissions of food. In one case, tax revenues increased the budget, while in the other case, a tax package was introduced that was neutral in terms of revenues, where a general VAT reduction was implemented from the revenues received. Based on their results, emission reductions of between 10% and 20% can be achieved in tax-only cases, while in revenue-neutral cases, between 2% and 9%. The way to achieve this was primarily through reducing the consumption of beef, pork, other meats, cheese, butter, and milk.

Sørensen et al. (2025) modelled the effects of a carbon tax planned to be imposed on farmers in Denmark. Based on its results, the cost increase caused by the tax will be passed on by farmers in the supply chain, so its impact will also be reflected in consumer prices, but land prices will also decrease. The tax will also facilitate the transition from livestock farming to plant production and from conventional agriculture to organic farming. Overall, the transition to lower-emission products, reduced production and the use of existing technologies will reduce greenhouse gas emissions from agriculture by 26%. At the same time, since Denmark is a small, open economy, there is also a substitution towards (cheaper) agricultural products produced in other countries, which in turn means an increase in emissions in these countries. This could reach up to 70% of the greenhouse gas emissions saved if other countries do not take steps to reduce emissions.

⁴⁰ https://gvh.hu/pfile/file?path=/en/resolutions/sectoral_inquiries_market_analyses/sectoral_inquiries/Tartos_el_elmiszer_gyorsitott_agazati_jelentes_a.pdf&inline=true (retrieved: 10 June 2025)

⁴¹ https://stainfo.ksh.hu/Stainfo/QueryServlet?ha=ID403_W (retrieved: 4 August 2025)

Mészáros et al. (2025) reviewed a total of 55 similar modelling studies, which typically examined the effects of subsidies in the case of vegetables and fruits, while the effects of taxation in the case of foods with a high carbon footprint (typically meat and dairy products) in order to achieve sustainability goals. Based on their results, public policy interventions that consist of several elements, typically include taxes, subsidies and consumer education, and possibly additional regulations (e.g. advertising restrictions, food labelling) are effective.

These results confirm that the reform of the subsidy system can substantially reduce food-related greenhouse gas emissions, and that this does not require a radical change. These interventions typically shape the diet in a positive way from a health point of view as well, and can be implemented without affecting the state (central) budget in either a positive or negative way.

In addition, the reform of the subsidy system may help domestic agriculture to become more resilient to climate change and preserve its export markets for canned and deep-frozen products.

In summary, reforming the agricultural subsidy system would not only lead to a more sustainable consumption pattern, but domestic agriculture would also be better able to adapt to changing climatic conditions. It would also have a positive impact on foreign trade, as it would promote a reduction in the export of products that are otherwise unprofitable at the societal level and preserve or even improve the export position of successful and profitable products.

The net financial and budgetary impact of the interventions depends on the extent to which they reduce subsidies for livestock farming and increase subsidies for plant production, particularly horticulture, as well as on the budget allocated to restructuring and closure payments. In a difficult budgetary situation, these programs can therefore be implemented without a net budgetary impact, and the favourable sustainability effects can still be achieved.

The net financial and budgetary impact of the interventions depends on the extent to which subsidies for livestock farming are reduced, and on the increase in subsidies for crop production and horticulture, as well as on the budget for the restructuring programme. Therefore, in a difficult budgetary situation, these programmes can be implemented without any net budgetary impact and favourable sustainability effects can still be achieved.

Communication. The proposed reform of the agricultural subsidy system may encounter serious resistance, especially from the side of farmers. In this regard, it is crucial to create financial incentives for farmers, which could take the form of support for restructuring or closure of activity (see Subchapter 4.1.9 for the details). At the same time, it is important to show farmers why it is worth switching products. Livestock farming is an area with a severe shortage of labour and requires continuous daily work, while the survival of farmers depends on the current state subsidies. On the other hand, the crop production and horticulture sectors are in many cases more mechanizable, offer more pleasant and less strenuous working conditions, and are fundamentally less financially dependent on the favour of the state. These are all benefits that can create real value for a farmer, thus helping them to abandon livestock farming and become a supporter of the program. It should also be seen that if some farmers give up livestock farming, the others will be in a relatively more favourable position (not only does the demand on the market decrease, but also the supply), so they can actually support the program, too.

4.1.2 Programs and incentives to reduce industrial use

Some meat and dairy products are consumed directly, but a substantial portion is consumed indirectly, incorporated into other products. In the case of dairy products and fats in particular, a substantial proportion of these can be omitted or easily replaced with plant-based products in terms of their function and the enjoyment value of the product. However, due to habits, manufacturing technology and fear of new things and innovations, manufacturers often do not take this step. Since half of the meat and dairy products need to be replaced with plant-based alternatives in order to achieve a 30% reduction in greenhouse gas emissions (Kozicka et al., 2023), the question of replacing as much industrial use as possible is unavoidable.

Intervention. In this analysis, we identified three areas where encouraging the switch to plant-based alternatives could be easily implemented: replacing lard and beef tallow with vegetable oils, replacing butter with margarine or vegetable oils, and replacing milk with plant-based drinks.

In order to encourage companies to try plant-based alternatives, a government program should be launched that industrial plants can join if they use small amounts of lard, beef tallow, butter, or milk as ingredients or additives in their products, meaning that the products are not primarily meat or dairy products. For this reason, replacing lard, beef tallow, butter, or milk would not fundamentally transform the essence of the products; most consumers would not even experience any of this, but a more sustainable product range would be created.

Within the framework of the programme, state aid would be available for product development (if necessary), and companies participating in the program would be able to purchase several months' worth of plant-based alternative raw materials for the products included in the program at a discount (with a subsidy intensity of 30–50%), on the condition that they do not return to using animal-based raw materials for the products in question for at least two to five years. This would encourage companies to try out new raw materials and integrate the change into their day-to-day operations, which would continue beyond the application period (2–5 years).

4.1.2.1 Replacing lard and beef tallow with vegetable oils

The replacement of animal fats with vegetable oils and fats has taken place in recent decades for many products. There were several reasons for this, partly health-related, partly technological. Vegetable oils and fats contain less saturated fatty acids than animal fats and are free of trans fatty acids. The latter is particularly harmful from a health point of view.⁴² From a technological point of view, vegetable oils are better handled in the food industry than basically solid animal fats due to their liquid state at room temperature.

In contrast to the positive trend of recent decades, voices have become louder in recent years, especially in 2025, to achieve a reversal of this.⁴³ That is why it is important to ensure that the spread of vegetable oils does not encounter obstacles in the future – obstacles that are largely unfounded and unscientific – thereby preventing an increase in environmental pollution (and deterioration in the health of the population).

Communication. There is several scientific research (e.g. Zong et al., 2018; Petersen et al., 2024; Zhao et al., 2024) available on the beneficial health effects of vegetable oils (or at least

⁴² <https://www.who.int/news-room/fact-sheets/detail/trans-fat> (retrieved: 10 June 2025)

⁴³ These voices were amplified in the U.S. with the election of Robert F. Kennedy Jr. as U.S. Secretary of Health: https://en.as.com/latest_news/seed-oils-under-fire-why-rfk-jr-and-influencers-are-sounding-the-alarm-on-fast-food-restaurants-n/ (retrieved: 10 June 2025).

more favourable than those of animal fats), which clearly support the fact that the proposed shift is also beneficial from a public health perspective. And the increasingly loud voices talking about the harmful health effects of oils obtained from plant seeds have no substantive scientific basis.⁴⁴ These positive and reassuring messages need to be substantially amplified so that the public is less likely to be swayed by false news and unscientific claims and does not turn away from vegetable oils.

4.1.2.2 Replacing butter with margarine

Butter can be easily replaced in terms of functionality with margarine or vegetable oils. Margarine is the oldest plant-based dairy alternative, with a history dating back to the Napoleonic Wars. The consumption of margarine has increased substantially in the second half of the 20th century due to its beneficial health properties, but today it is slightly decreasing. Misconceptions often play a role in this. In the past, the oils used for margarine were partially hydrogenated to harden them, which produced trans fatty acids. Nowadays, however, margarines are made with a different technology, essentially cold mixing and crystallising vegetable oils, so there is no need for (partial) hydrogenation, and therefore the final product will be free of trans fatty acids.⁴⁵

In bakeries and confectioneries, margarine is widely used because of its lower price and longer shelf life, but butter is still used in many places, mainly because of its better taste, texture and higher social prestige.

Nowadays, however, there are several alternative margarines available that are fully competitive with butter in terms of taste, texture and quality,⁴⁶ so they can be suitable substitutes for premium bakery and confectionery products. World-renowned chefs also recommend these products,⁴⁷ and they also perform well in food innovation competitions in Hungary.⁴⁸ At the same time, the greenhouse gas emissions per unit of these products are 50–77% lower than those of butter made from cow's milk.⁴⁹

Expected effects. Approximately 20 litres of milk are needed to produce one kilogram of butter,⁵⁰ which means that the product has a large environmental footprint. (The buttermilk produced as a by-product of butter production is also suitable for consumption, but its use is not widespread in Hungary, and it is likely to be used as animal feed.) In 2023, 3.4% of greenhouse gas emissions associated with food products were attributable to butter alone. According to data from the HCSO, direct annual butter consumption in households was 1.5 kg

⁴⁴ <https://publichealth.jhu.edu/2025/the-evidence-behind-seed-oils-health-effects> and <https://www.health.harvard.edu/heart-health/choosing-heart-healthy-oils-for-home-cooking> (retrieved: 9 September 2025)

⁴⁵ <https://storeinsider.hu/cikk/margarinyartas-tenyek-es-tevhitek> (in Hungarian only, retrieved: 10 June 2025)

⁴⁶ For example, according to sensory tests, 40%, 50% and 59% of consumers in Finland, Poland and the United States, respectively, said that one of these products tastes exactly the same as butter, and similar results have been achieved in Germany and Sweden (<https://bunge.com/Markets-We-Serve/Plant-Based-Foods/Plant-based-Dairy/Beleaf-PlantBetter>, retrieved: 10 June 2025).

⁴⁷ <https://trademagazin.hu/en/gordon-ramsay-a-rama-novenyi-vajalternativat-valasztotta/> (retrieved: 10 June 2025)

⁴⁸ <https://trademagazin.hu/hu/rendezvenyek/innovaciok-napja-es-inno-dor-ev-innovacioja-2025-beszamolo/> (in Hungarian only, retrieved: 10 June 2025)

⁴⁹ https://www.rama.com/hu-hu/-/media/Project/Upfield/Brands/Flora/Rama-Hu/Assets/New-Rama-Images/Rama-Butter-Alternative-unsalted-250g-wrapper_LCA_statement_HU.pdf and https://eleplant.hu/az_eleplantrol/ (in Hungarian only, retrieved: 10 June 2025)

⁵⁰ <https://www.allattenyesztok.hu/aktualis/hirek/vajhatarozo-mi-a-vaj> (in Hungarian only, retrieved: 10 June 2025)

per capita in 2020,⁵¹ and this has not moved substantially since then.⁵² Although no direct data are available on industrial use, according to Statista's data,⁵³ total domestic butter consumption in 2017 was 2.5 kg/capita. This year, according to the data of the HCSO, direct consumption was 1.3 kg/capita, so industrial consumption is 1.2 kg/capita. The question can also be approached by considering how many kilograms of butter correspond to the 69.7 kg of CO₂ equivalent butter per capita, according to EPLCA data. The greenhouse gas emissions associated with one kg of butter are about 15 kg CO₂ equivalent,⁵⁴ so based on this, total butter consumption is 4.6 kg per capita, meaning that industrial use is double direct consumption, at 3.1 kg per capita per year. The actual value is therefore likely to be between these two estimates.

The environmental footprint of margarine is substantially smaller than that of butter, as confirmed by the life-cycle assessments presented earlier. Margarine consumption is substantially higher than butter consumption (approximately four times as much⁵⁵), but a further shift towards margarine would offer substantial potential for reducing emissions.

If the programme succeeds in halving current industrial butter consumption, it will save between 84,000 and 156,000 tonnes of carbon dioxide equivalent greenhouse gas emissions, which corresponds to a reduction of between 0.4% and 0.8% of all food-related emissions. At first glance, this may not seem large, but it represents one-third to one-fifth of the greenhouse gas emissions associated with total domestic vegetable consumption, so it is a fairly substantial factor in comparison.

Communication. When communicating the intervention, it is worth referring to public health considerations in addition to sustainability factors. It is also important to emphasise that the products resulting from the recipe changes will also be consumed by the growing number of people who are lactose- and milk protein-intolerant, thus substantially expanding the range of products they can consume.

The use of vegetable oils and products based on them has beneficial health effects. According to a study by Zhang et al. (2025), replacing butter with vegetable oils, primarily olive oil, soybean oil and rapeseed oil, can significantly reduce premature mortality.

Butter cannot be consumed by people who are lactose-intolerant or have milk protein intolerance, whereas plant-based alternatives are allergen-free, making products that use them more inclusive and helping to serve consumers with increasingly common food intolerances. This could also provide further incentive for businesses to participate in the subsidy programme, as the reformulated product could reach a wider consumer base. On the other hand, it is more difficult to attack a government programme that would objectively improve the lives of people suffering from allergen intolerance, especially since milk and lactose intolerances are widespread enough that most people have family members or acquaintances who are sensitive to them and would therefore benefit from the intervention.

⁵¹ https://www.ksh.hu/stadat_files/jov/en/jov0026.html (retrieved: 10 June 2025)

⁵² <https://www.reportlinker.com/dataset/2d4e920b335578268e4cfe7d7af3ecf264cf225c> (retrieved: 10 June 2025)

⁵³ <https://www.statista.com/statistics/415277/butter-consumption-per-capita-by-country-europe/> (retrieved: 10 June 2025)

⁵⁴ https://www.rama.com/hu-hu/-/media/Project/Upfield/Brands/Flora/Rama-Hu/Assets/New-Rama-Images/Rama-Butter-Alternative-unsalted-250g-wrapper_LCA_statement_HU.pdf (retrieved: 10 June 2025)

⁵⁵ <https://trademagazin.hu/en/vaj-es-margarinmarkak-az-ero-veluk-van/> (retrieved: 10 June 2025)

4.1.2.3 *Replacing milk with plant-based drinks*

Many bakery products (e.g. croissants, donuts, most of the sweet and savoury pastries) contain small amounts of milk, among other things, related to yeast. The milk used has virtually no effect on the taste and texture of these products, which is why it can be easily replaced by a plant-based drink (e.g. almond, oat, rice or soy drink).

The substitution of milk for these bakery products – due to the large volume and regular consumption of bakery products – can have a substantial positive impact from a sustainability point of view. In addition, in this case, it can be said that an allergenic product will be replaced, so the modified bakery products made using plant-based drinks will be available for a wider range of consumers, which is a favourable step for those who are sensitive to milk protein and lactose. Given that this consumer group currently has difficulty accessing bakery products that they can consume, and that these are typically expensive, the proposed change will have a particularly important positive impact on them.

Communication. In the communication related to the program, it is worth emphasising that milk is typically present in small quantities in these products, so the perceived health benefits of milk do not apply to them, and replacing milk will not reduce calcium or protein intake, for example. On the other hand, the resulting reformulated products will be suitable for consumption by people who are sensitive to milk protein and lactose, which is a real consumer benefit for those affected.

4.1.3 **Reform of consumption-based taxes**

The role of subsidies in promoting a sustainable diet has already been discussed in Subchapter 4.1.1. While in that subchapter we basically focused on agricultural subsidies, in this subchapter we examine taxes, especially consumption-based taxes.

The most substantial consumption-based tax is VAT, which is one of the most important sources of revenue for the Hungarian budget. There are currently three VAT rates in Hungary: in addition to the standard rate of 27%, there are two reduced rates (5% and 18%). Furthermore, VAT is 0% on certain products and services.

According to current Hungarian regulations (Annex 3 of Act CXXVII of 2007 on Value Added Tax), the 5% VAT rate applies to pork, beef, lamb, mutton, goat meat, poultry and milk, among other things. No plant-based foods are subject to the 5% VAT rate.

Products subject to the 18% VAT rate (according to Annex 3/A of Act CXXVII of 2007 on Value Added Tax) include essentially all dairy products and cereal-based products, typically bakery products.

On the other hand, all plant-based foods – except for cereal-based products mentioned in the previous paragraph – are subject to the 27% VAT rate, regardless of their level of processing. In Hungary, plant-based foods, including vegetables, fruits, legumes and nuts and seeds, are at a substantial disadvantage compared to meat and dairy products, simply because of state tax regulations. In most EU Member States, the VAT rate for plant-based meat and dairy alternatives is the same as that for meat and dairy products, while the VAT rate for fruits and vegetables is typically the most favourable one,⁵⁶ so the playing field is at least level. However, considering the high level of greenhouse gas emissions and other pollution caused by meat and dairy products, it would be justified to impose the highest possible VAT rate on meat and dairy products.

⁵⁶ <https://epha.org/living-environments-mapping-food-environments-vat/> (retrieved: 10 June 2025)

Intervention. The ideal situation would be the opposite of the current domestic VAT regulations, where the highest 27% VAT would be levied on meat and dairy products, while only 5% (or the lowest possible) VAT would be levied on plant-based products, including vegetables, fruits, legumes and nuts and seeds. As a result of the proposed VAT rate changes, the prices of meat and dairy products would increase substantially (although the tax burden would probably not be fully shifted to consumers), but as the prices of plant-based products would decrease, the cost of individual consumers' total food basket would not necessarily increase. This depends on exactly which products are included in the basket.

If, on the other hand, budget revenues increase at the level of the national economy due to the change in VAT, it is important that the state redistributes the surplus revenue to the population in the form of a lump sum compensation, thus ensuring that the measure is financially advantageous for as many consumers (and voters) as possible, and that the majority of society supports the measures.

As a result of the restructuring of the VAT system, a decline in demand for meat and dairy products is expected, so it is of paramount importance to make farmers interested in this case as well. This can most easily be achieved through the restructuring programmes described in Subchapter 4.1.9.

Expected effects. As Hungarian consumers are very price-sensitive, the consumption structure is expected to react substantially to the consumer price changes caused by VAT changes. The increase in the consumption of meat and dairy products in recent years is partly due to the fact that the VAT rates of these products have been reduced in several rounds, so in relative terms, the state has made these products cheaper and cheaper.

The report prepared as a result of the GVH's accelerated sector inquiry into the market for milk and dairy products in 2023⁵⁷ shows (Figure 42) that in the case of fresh milk and rice drinks, the average purchase price for retailers was essentially the same in 2022, but due to higher retailer margins and, even more so, different VAT rates, the consumer price of rice drinks was already 44% higher than that of fresh cow's milk. With the same VAT rate, the price difference would have been only 20%. Moreover, a lower VAT rate would stimulate consumption, which could lead to a reduction in the retailer's margin (as the product's turnover rate would increase), meaning that the average consumer price of the product would eventually equalise with the average consumer price of fresh milk. Even at 2022 retailer margins, rice drinks would be cheaper than cow's milk if plant-based drinks were subject to a 5% VAT rate while cow's milk was subject to a 27% rate.

The impact of VAT rates, consumption taxes, and subsidies on consumption has been modelled by several studies. In their analysis, Springmann et al. (2025) examined the effect on consumption of reducing the VAT level on vegetables, fruits, legumes, nuts and seeds to 0% in all EU Member States while increasing the VAT level on meat and dairy products to the highest level in each country (27% in Hungary's case). As the modelled change resulted in the largest tax restructuring in the case of Hungary (a substantial VAT increase in the case of meat and dairy products, and a substantial VAT reduction in the case of vegetables and fruits), the environmental (and health) benefits were also one of the most substantial in the case of Hungary. Based on the results, food-related greenhouse gas emissions would be reduced by 0.7 Mt carbon dioxide equivalent or 4.8% if the government were to make a full VAT change

⁵⁷ https://gvh.hu/pfile/file?path=/en/resolutions/sectoral_inquiries_market_analyses/sectoral_inquiries/Tej_es_te_jertek_gyorsított_agazati_vegleges_jelentes_a.pdf&inline=true (retrieved: 10 June 2025)

(Supplementary information, SI Table 6). Meanwhile, the change would have no budgetary impact, and based on the modelling results, the state's VAT revenues would remain unchanged (Supplementary information, SI Table 8). As the proposal would only reduce the VAT rate on fruit and vegetables to 5% (rather than 0%), the resulting additional VAT revenue could be distributed among members of society as a lump sum compensation. According to the analysis of Springmann et al. (2025), reducing the VAT on vegetables and fruits to 0% would cost USD 1.12 billion, or approximately HUF 390 billion. If we proportion this amount to a reduction in VAT from 27% to 5% rather than 0%, it would mean approximately HUF 72 billion less in costs for the state. This corresponds to approximately HUF 7,600 per capita per year. Since this is a small amount in itself, it is worth spending this HUF 72 billion on increasing some kind of social transfer (e.g. family allowance and/or pension), thereby helping consumers in more difficult circumstances.

Communication. In addition to sustainability messages, the communication strategy should convey to consumers that VAT changes will cause the prices of some products to rise while others will fall, but the value of their total consumer basket is expected to remain unchanged or change only slightly. According to estimates, the VAT change would result in a slight positive budget balance. By redistributing this amount through social transfers to consumers in more difficult financial situations (e.g. parents raising children, pensioners), it can be ensured that the proposed reform of the VAT system will not place a substantial financial burden on anyone.

At the same time, as we have emphasised earlier, it is very important to win over agricultural producers, so in parallel with the VAT reform, it is necessary to communicate the restructuring programmes to them as well (see Subchapter 4.1.9).

4.1.4 Additional taxation of meat and dairy products

Due to the negative health and environmental impacts of meat and dairy products, they may also be subject to taxes specifically aimed at promoting healthy diets or internalising environmental externalities. One of the purposes of the excise tax on fossil fuels is also to reflect environmental externalities in prices,⁵⁸ while the purpose of the public health product tax, for example, is “to suppress the consumption of foods which are considered non-beneficial for public health considerations, to promote healthy diets” based on Act CIII of 2011. Based on both aspects, it would be justified to include meat and dairy products in the scope of these taxes.

4.1.4.1 Taxation of meat and dairy products from a health perspective

Intervention. There are basically two types of possible interventions in the field of public health regarding meat and dairy products: the elimination of the exceptions in the current regulation of the public health product tax, and the extension of the public health product tax to high-fat foods.

The current regulation of the public health product tax explicitly provides that milk-based beverages and packaged food products containing added sugar and/or sweeteners are not subject to the tax. On the one hand, this is unjustified, since if the goal is to reduce sugar consumption, then the exclusion of certain sugar-containing foods from this has the opposite effect to the goal, as it directs consumption towards them. On the other hand, since similar soy

⁵⁸ https://taxation-customs.ec.europa.eu/taxation/excise-taxes/revision-energy-taxation-directive_en (retrieved: 4 July 2025)

or almond-based drinks, for example, are subject to the public health product tax, the current regulation does not ensure the neutrality of competition between substitutes (Slade and Markevych, 2024), and penalises those who are sensitive to milk protein, for whom following their diet already entails substantial additional costs. Thirdly, the law currently exempts more environmentally harmful products from taxation, while imposing additional taxes on more sustainable products. For all these reasons, it is justified to terminate the exceptions for dairy products in points aa), ab), cc) and cd) of Annex 1 of Act CIII of 2011.

In addition, there are examples of regulations similar to the Hungarian public health product tax that not only tax salt and sugar content, but also cover foods high in fat, especially saturated and trans fatty acids. In Denmark, such a tax was introduced in 2011, the scope of which also covered meat and dairy products, but the tax failed after 15 months, partly due to the industry lobby and partly due to other factors (Bødker et al., 2015). The Hungarian regulation could also be supplemented with an element that would make products containing more than 2.3 g of saturated fat per 100 g taxable. In the case of this type of tax, however, it may be worth considering the redistribution of the tax revenues generated to society in the form of a lump sum compensation. This measure is likely to substantially increase the popularity of the intervention.

Expected effects. The impact of tax changes always depends on the tax rates. Taxes levied for public health purposes reduced consumption in the short term (Pineda et al., 2024), and this was also the case in Hungary. After the introduction of the public health product tax in 2011, the consumption of processed foods decreased by 3.4% (Bíró, 2015), although due to the increase in income, consumption started to increase over time and by 2018 it was already above the initial values. Therefore, long-term sustainability also requires other complementary programmes and complex interventions (Berezvai et al., 2024). This applies to all types of tax changes, and in this study we have also made several recommendations (see Subchapters 4.1.5 and 4.1.6) that will help to ensure the long-term sustainability of the effects.

The Danish saturated fat tax increased product prices by approximately 15% (Jensen et al., 2015), resulting in a significant reduction in saturated fat consumption (4–6%) and a 0.9% decline in sales of products subject to the tax (Pineda et al., 2024).

Communication. When abolishing the exemptions from the public health product tax or expanding the range of products, it is worth presenting the public health benefits, primarily the expected reduction in obesity and the expected decrease in the incidence of certain diseases related to unhealthy lifestyles (Pineda et al., 2024; GBD 2021 Diseases and Injuries Collaborators, 2024). One of the central causes of obesity in Hungary is excessive fat intake (Sarkadi Nagy et al., 2017), the reduction of which would therefore be desirable from a public health point of view, and this is the aim of the tax change.

4.1.4.2 Environmental tax on meat and dairy products

Intervention. Several studies argue in favour of an environmental tax on meat and dairy products. Banerjee (2025) shows in his commentary that this type of tax will not necessarily be regressive (affecting the poorer more) and unpopular, and it is primarily the meat and dairy lobby that opposes these taxes, while a larger part of the population supports it if it is clear where the revenues go and what they are used for. At the same time, support for this type of tax is much higher in Western Europe than in Central Europe, although in the Czech Republic, for example, only 53% of the population is explicitly against it, and its support is even higher among young people (Kmeťková et al., 2025). In Hungary, however, the social acceptance of

such a tax is quite low, even if the tax revenues are redistributed to the members of society. In terms of the redistribution mechanism, spending on education and health care is the most popular in Hungary. People living in cities (and the capital) and those with higher levels of education are more likely to support a carbon tax in Hungary (Muth et al., 2024). At the same time, based on the literature review by Nazari et al. (2024), social opinion and opposition to the carbon tax (environmental tax) can best be managed and moved in a positive direction by the fair and just design of the tax, the redistribution of revenues and the appropriate, trust-building communication. In the case of an environmental tax, the redistribution of revenues to society is therefore crucial.

There are several scenarios that can be followed when determining tax rates:

1. In line with the purpose of the study, only the external costs related to greenhouse gas emissions are priced through the tax (traditional carbon tax approach).
2. We impose a complex environmental tax that covers all external costs incurred, not just greenhouse gas emissions.
3. We adjust tax rates to achieve a predetermined emission reduction target (in this case, a 30% reduction in methane emissions).

Springmann et al. (2017) followed the traditional carbon tax approach in their modelling. As a result, a 12% tax would be imposed on beef, a 6% tax on pork, and a 9% tax on milk and dairy products in Hungary.

In the case of an environmental tax that includes all external costs, the tax would be 157% on beef (and beef products), 118% on pork (and pork products), and 52% on milk and dairy products.⁵⁹ This would also mean that market prices would be in line with the TCA principle.

We estimated the tax rate required to achieve a 30% reduction in emissions using the price elasticities estimated for the EU by Bouyssou et al. (2024) in their meta-analysis, so that the consumption of beef, pork and dairy products would be reduced by 30%. We used compensated (Hicksian) price elasticities for the estimation, as part of the proposal is to redistribute the revenue from the tax to members of society, so there is no income effect for the average consumer. The cross-price elasticities between beef, pork and dairy products were not taken into account, as a nearly uniform price increase will hardly change relative prices, so no substitution between these product groups is expected. Based on this, a tax of 53% should be levied on beef, 50% on pork and 29% on milk and dairy products. Table 2 summarises the tax rates required for each scenario.

Table 2. Tax rates proposed for meat and dairy products in each of the scenarios examined

Product group	Carbon tax (scenario 1)	Complex environmental tax (scenario 2)	30% reduction in consumption (scenario 3)
Beef	12%	157%	53%
Pork	6%	118%	50%
Milk	9%	52%	29%

Source: own calculation based on Springmann et al. (2017), <https://www.levego.hu/sites/default/files/Internalization-of-Externalities-of-Animal-Derived-Products-in-Hungary-20250721-Final.pdf> (retrieved: 29 July 2025) and Bouyssou et al. (2024).

⁵⁹ <https://www.levego.hu/sites/default/files/Internalization-of-Externalities-of-Animal-Derived-Products-in-Hungary-20250721-Final.pdf> (retrieved: 29 July 2025)

Expected effects. When estimating the expected effects, we refer to several related studies and analyses already presented in Subchapter 4.1.1 on the reform of the agricultural subsidies, which will not be repeated here.

The introduction of an environmental tax should be implemented in such a way that the resulting government revenue is returned to citizens as a lump-sum compensation – in scenario 3, the tax rates were also determined according to this principle. Based on microsimulation modelling, Kulmer et al. (2025) pointed out that the same amount of greenhouse gas emission reductions can be achieved with or without compensation, but compensation reduces social disparities and increases social welfare, especially among poor households, making it particularly beneficial in terms of overall welfare.

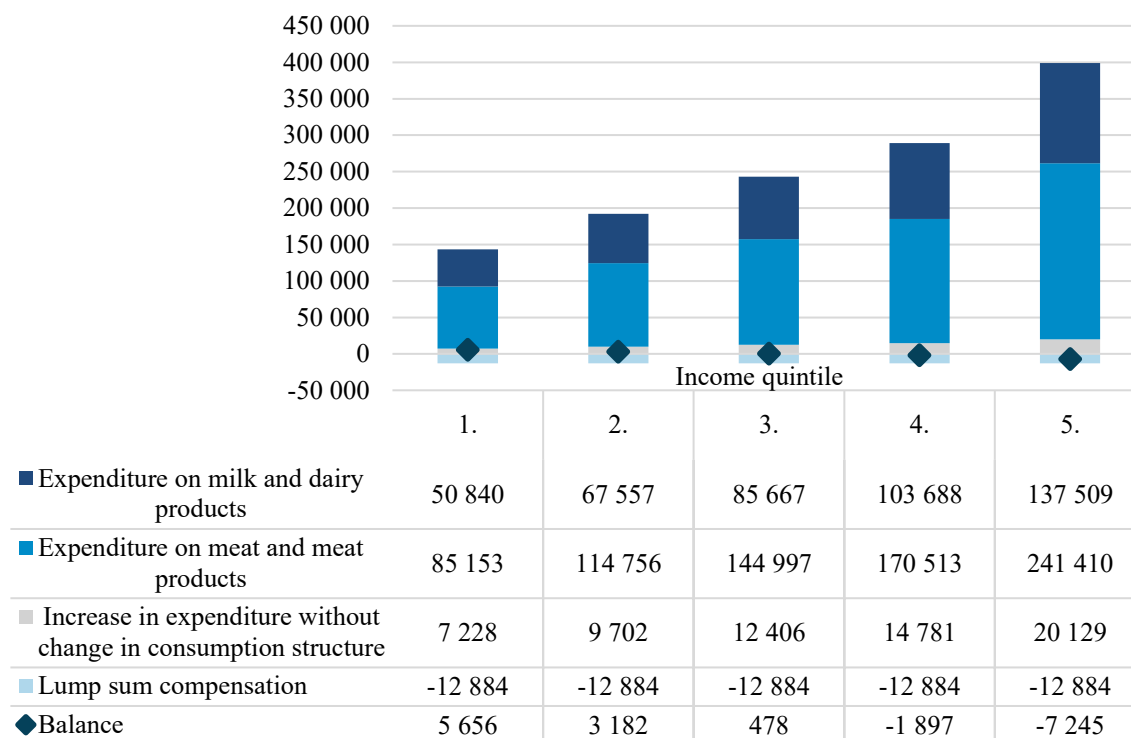
In the following, we will only examine scenarios 1 and 3, as the complex environmental tax in the case of meat would be so high that its impact on consumption and thus on tax revenues cannot be meaningfully estimated based on the price elasticities available in the study by Bouyssou et al. (2024).

In the case of scenario 1, the analysis of Springmann et al. (2017) is used as a basis for estimating tax revenues and consumption decreases. We converted tax revenues to Hungarian forints at the average 2015 US dollar exchange rate (HUF 279)⁶⁰ and valorised them to 2023 values according to the consumer price index of the HCSO.⁶¹ Based on these figures, beef consumption would decrease by 2.4%, pork consumption by 1.8% and milk consumption by 0.7%, while the intervention would generate HUF 124 billion in tax revenue. This amounts to HUF 12,884 per capita, meaning that the introduction of the tax would still be beneficial for the first three income quintiles (60% of society) even if they did not change their consumption patterns at all (Figure 8).

⁶⁰ <https://www.mnb.hu/en/arfolyam-lekerdezes> (retrieved: 30 July 2025)

⁶¹ https://www.ksh.hu/stadat_files/ara/en/ara0001.html (retrieved: 30 July 2025)

Figure 8. Per capita expenditure on meat and dairy products in 2023, expected increase in expenditure and compensation by income quintiles, scenario 1 (HUF/capita/year)



Note: the proportion of beef and pork within meat consumption was determined based on consumption data for 2020.

Source: own calculation based on HCSO data (https://www.ksh.hu/stadat_files/jov/en/jov0022.html, https://www.ksh.hu/stadat_files/jov/en/jov0026.html, https://www.ksh.hu/stadat_files/nep/en/nep0001.html, https://www.ksh.hu/stadat_files/ara/en/ara0001.html, retrieved: 30 July 2025), data of the Central Bank of Hungary (<https://www.mnb.hu/en/arfolyam-lekerdezes>, retrieved: 30 July 2025) and per capita consumption expenditure of households dataset compiled on individual request by the HCSO, as well as Springmann et al. (2017).

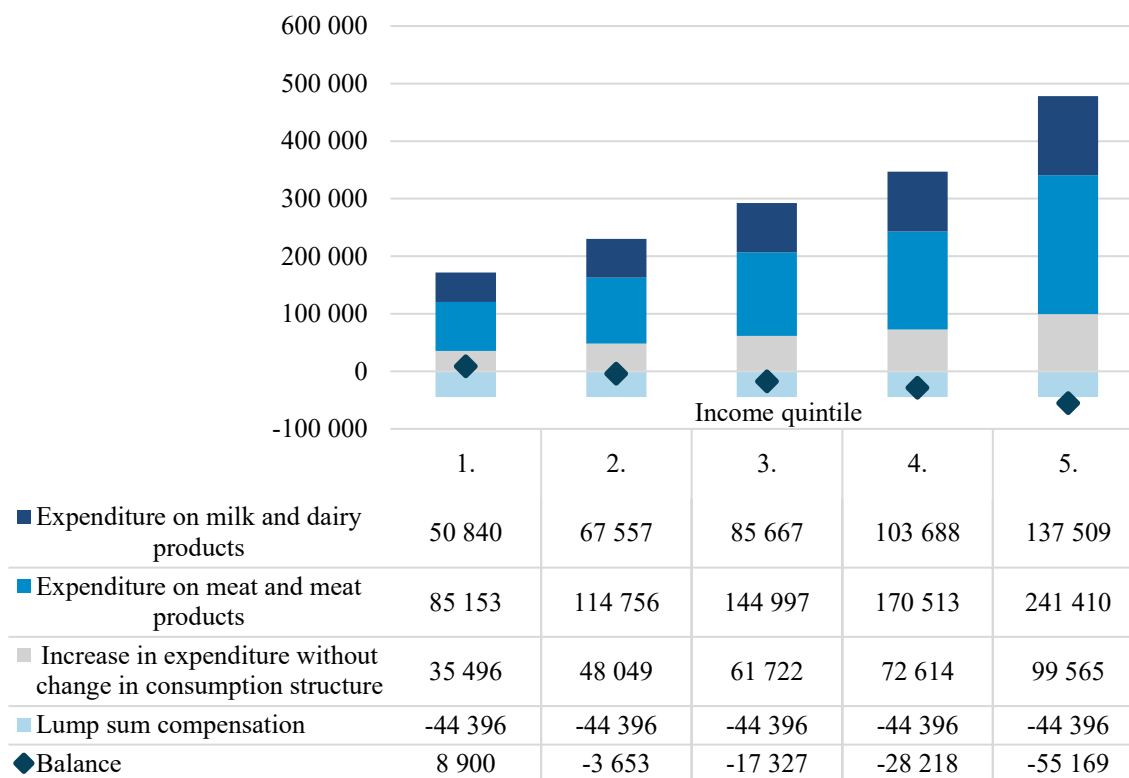
Based on the modelling results of Springmann et al. (2025), greenhouse gas emissions would be reduced by 13.8% (Supplementary information, SI Table 9) if food were taxed based on its greenhouse gas emissions, taking into account the social cost of carbon dioxide emissions.

In scenario 3, consumption of beef, pork and dairy products is expected to fall by 30%, as tax rates are set accordingly. Based on consumer spending data, taking into account the 30% decrease in consumption, tax revenues of HUF 426 billion would be generated as a result of the measure, which means HUF 44,396 per capita. Based on this, the lowest income quintile would benefit even if its consumption structure remained unchanged, the second income quintile would be essentially neutral, and the compensation value for the top three income quintiles would be less than the increase in their expenditure if they did not change their consumption structure (Figure 9). If the wealthiest income quintile would not receive compensation (similarly to the transport proposal of the Clean Air Action Group⁶²), then a per capita compensation of HUF 55,877 could be paid, with which the bottom two income quintiles

⁶² https://levegomunkacsoport.blog.hu/2021/06/14/rendkivul_igazsagtalansag_a_magyar_autosok_helyzete_adjunk_vissza_evi_325_ezer_forintot_8_millio_szegeen (in Hungarian only, retrieved: 17 July 2025)

would clearly win, while the third income quintile would be essentially indifferent, and only the top two income quintiles would be disadvantaged – assuming that consumption patterns remain unchanged.

Figure 9. Per capita expenditure on meat and dairy products in 2023, expected increase in expenditure and compensation by income quintiles, scenario 3 (HUF/capita/year)



Note: the proportion of beef and pork within meat consumption was determined based on consumption data for 2020.

Source: own calculation based on HCSO data (https://www.ksh.hu/stadat_files/jov/en/jov0022.html, https://www.ksh.hu/stadat_files/jov/en/jov0026.html, retrieved: 30 July 2025) and per capita consumption expenditure of households dataset compiled on individual request by the HCSO, and Bouyssou et al. (2024).

However, beef, pork and dairy consumption is expected to fall by 30%, suggesting that their consumption patterns are being significantly restructured by consumers. Based on the results of Bouyssou et al. (2024), part of this decrease will be reflected in an increase in poultry meat and egg consumption, but the consumption of vegetables and fruits, cereals, fats and oils, and other foodstuffs will also increase based on cross-price elasticities.

In the case of both scenarios examined, it is clear that as a result of compensation, the poorest social strata are better off financially, even while maintaining their consumption patterns. Ultimately, we distribute exactly the same amount among the members of society that is generated as tax revenue, and the redistribution mechanism favours the poorer, so the introduction of an environmental tax increases social justice and reduces income disparities. In addition, as a result of compensation, there is no need to fear that food security will decrease, which some studies (e.g. Gundersen et al., 2025) formulate as a counterargument in relation to the taxation of meat and dairy products. These claims are also reiterated in the communications

of meat and dairy lobby organisations,⁶³ but the taxation supplemented by compensation actually helps to ensure food security, as it provides additional income for the poorest strata. At the same time, even these communications acknowledge that access to animal-based foods is very unequal in the world. Since the consumption of animal-based products is fundamentally high in Hungary (this is the cause of the methane emission problem), and meat consumption in each income decile exceeds the official recommendation (Vetóné Móznér and Szűcs, 2024), so reducing this consumption, which mainly affects the wealthier segments of the population, will not lead to any health or food security problems.

Communication. In the case of an environmental tax, communication is one of the keys to a successful implementation (Nazari et al., 2024). Communication must be based on the fact that Hungarians describe climate change as a serious problem, based on the Eurobarometer⁶⁴ surveys, and that we can take action to reduce climate change with the environmental tax. It is also necessary to present the positive benefits that can be expected as a result of the introduction of the tax. In addition, tax revenues will not increase the budget but will be returned to the people in the form of lump sum compensation, so there will actually be no deductions; only the relative prices of products will change in relation to each other, keeping sustainability goals in mind. However, the redistribution of revenues must take into account fairness and justice, low-income and marginalised social groups, avoiding the regressive nature of the tax, which could undermine public support.

As the distribution of income and consumption in society is skewed to the right, depending on the scenario, there may be more people who benefit from the introduction of the environmental tax, i.e. those whose shopping basket value increases less than the amount of compensation.⁶⁵ By altering the consumption structure, a substantial part of society will be better off. In communication, it is therefore also necessary to emphasise that this is also a socio-political measure that serves social justice and the reduction of inequalities.

In addition, it is worth saying in all communications that most consumers can afford their current consumption structure, as compensation makes it possible for poorer strata, while for the wealthier, the additional expenditure does not represent a substantial increase in expenditure in either scenario. And if they change their diet a little, they will even have extra money left over, so they can benefit from the change by saving money or spending it on other purposes.

4.1.5 Increasing consumer awareness

Consumers have a substantial influence on greenhouse gas emissions through their everyday purchasing decisions. If consumers choose more sustainable, lower-emission foods in stores, the market for them will grow more, while the market for high-emission products will shrink. From this point of view, it is particularly unfavourable that consumers typically underestimate the difference in greenhouse gas emissions between plant-based and animal-based foods (Cadario et al., 2025). Hannah Ritchie, Head of Research at Our World in Data, proves with data⁶⁶ that while most consumers think of increasing the consumption of local (domestic) food

⁶³ <https://meatthefacts.eu/home/activity/beyond-the-headlines/food-security-at-risk-the-consequences-of-limiting-animal-source-foods-consumption/> (retrieved: 24 October 2025)

⁶⁴ <https://europa.eu/eurobarometer/surveys/detail/3472> (retrieved: 16 July 2025)

⁶⁵ In the context of car use, a similar analysis by the Clean Air Action Group also sheds light on this: https://levegomunkacsoport.blog.hu/2021/06/14/rendkivul_igazsagtalán_a_magyar_autosok_helyzete_adjunk_vissza_evi_325_ezer_forintot_8_millio_szegen (retrieved: 17 July 2025).

⁶⁶ <https://ourworldindata.org/food-choice-vs-eating-local> (retrieved: 12 July 2025)

when it comes to reducing food-related greenhouse gas emissions, in reality, this is of negligible importance, and what we eat is a much more important question than where our food comes from.⁶⁷ This is also confirmed by Scarborough et al. (2023) based on real British consumption data. Unfortunately, in many places, sustainability is still equated with the consumption of local food alone,⁶⁸ and little is said about the substantial differences between different types of food from an environmental point of view.

Intervention. It would be useful and necessary to introduce a mandatory environmental and sustainability labelling system under state supervision, which was also proposed by the GVH at the beginning of 2024.⁶⁹ The essence of this is to make it easy to compare the environmental impact of different foods, thereby facilitating consumer choice.

The introduction of such a labelling system is not an easy matter, as various data are needed to determine the environmental impact and greenhouse gas emissions caused by individual products. In the first instance, it is worth using generic data, which is already available from several international databases,⁷⁰ which can be overwritten and overturned by individual companies with their own measurements and data (Deconinck et al., 2023).

The Organisation for Economic Co-operation and Development (OECD) has addressed this issue in detail in recent years, and, in its latest publication (OECD, 2025), it has identified eight critical building blocks that are necessary to be able to reliably and widely measure the carbon footprint of food. The general construction of this measurement system and infrastructure is not possible without the will and support of the government. At the same time, we would like to emphasise once again that even without this specific measurement system, it is possible to mark the environmental footprint of food products using only generic data, which would definitely be a positive step as a starting point.

Czarnecki et al. (2018) examined what a well-functioning environmental labelling system should look like, which not only informs but also influences consumers. In a narrow sense, the eco-labelling system helps consumers who care about environmental protection to be able to buy products that are most acceptable to them and that best meet their personal standards. However, in order to reduce the environmental impact, it is of paramount importance that a properly structured environmental labelling system also reaches and motivates consumers who would not be open to the consumption of more sustainable products for personal reasons. The study presents three elements that can help to involve consumers who have little or no interest in environmental protection.

- The labelling system can be designed in such a way that it appeals to consumers who are influenced by social norms.
 - The environmental labelling system on products helps everyone to see what product each consumer has chosen, thus making the choice of more sustainable products more visible. As a result, more people can choose these products, showing that they live in a sustainable way, or make more thoughtful consumer choices, or – because these products are often more expensive – they are wealthy.

⁶⁷ Detailed product-level data is available on the Our World in Data website:

<https://ourworldindata.org/grapher/food-emissions-supply-chain> (retrieved: 10 June 2025).

⁶⁸ For example, <https://tejsziv.hu/valassz-hazait> (in Hungarian only, retrieved: 10 June 2025).

⁶⁹ https://gvh.hu/pfile/file?path=/en/resolutions/sectoral_inquiries_market_analyses/market_analyses/Zold_allitasok_piacelemzes_tanulmany_240111_a.pdf&inline=true (retrieved: 10 June 2025)

⁷⁰ Examples include Agribalyse (<https://agribalyse.ademe.fr/>, retrieved: 10 June 2025), Hestia (<https://www.hestia.earth/>, retrieved: 10 June 2025), or The Big Climate Database (<https://denstoreklimadatabase.dk/en>, retrieved: 10 June 2025).

- Some consumers follow the crowd, so communicating how many people have chosen a sustainable product can encourage others to choose those products, too.
- The labelling system can also refer to more widely accepted norms.
 - It is important to ensure that the sustainability labelling system is not only identified with environmental protection. Instead, it should be based on more general values such as thrift, health, personal responsibility, waste reduction and the principle of not harming others. In other words, the labelling system should not serve a particular identity or specific social and political views.
- The labelling system could highlight personal, short-term benefits.
 - In addition to the abstract and distant social benefits, it is also worth communicating and presenting immediate, tangible benefits (e.g. protection of health due to fewer chemicals, financial savings).

Furthermore, based on the literature, it is clear that consumer-friendly design, primarily the use of traffic light colours, considerably helps consumers to interpret the labelling correctly (Rondoni and Grasso, 2021). This is also the conclusion reached by the Dutch competition authority in its 2022 study.⁷¹

Expected effects. The effects of different environmental (sustainability) labels on products on customers and willingness to pay were investigated by Tebbe and von Blanckenburg (2018). The study examined five types of organic (bio) production logos and one fair trade logo. Based on their results, these logos and the information they provide were positively rated by consumers, especially for plant-based and non-perishable products. The research did not find a greater willingness to pay for animal-based products with such labels. Displaying more than one logo did not increase the willingness to pay, even if the logos examined different dimensions (e.g. organic and fair trade). Based on this, consumers treat sustainability as somewhat binary, which shows on the one hand that it is necessary to create a well-designed and credible labelling system, and on the other hand, that it also affects customers.

Cadario et al. (2025) present the results of five studies. Based on these, it can be seen that a labelling system that shows carbon dioxide emissions in absolute terms and also rates them on an ordinal scale (from A to E, reminiscent of traffic lights) (Figure 10), helps consumers recognise the difference in emissions between plant-based and animal-based foods. In addition, it was able to reduce the choice of animal-based foods in both hypothetical and real-world situations, especially among those for whom eating sustainably is important. In real-life decision-making situations, the choice of plant-based snacks (salted cashews) increased from 68% to 81% (compared to beef snacks) when the visual sustainability label was displayed. These results therefore show that such a labelling system can indeed influence consumers' product choices.

⁷¹ <https://www.acm.nl/nl/publicaties/onderzoek-naar-de-invloed-van-duurzaamheidskeurmerken-op-consumenten> (in Dutch only, retrieved: 10 June 2025)

Figure 10. Visual appearance of the labelling system showing the carbon footprint of the product



Source: Cadario et al. (2025), Fig. 4.

Communication. Creating a mandatory sustainability labelling system for products is no easy task, but there is clearly consumer demand for it, and it can positively influence consumers' purchasing decisions. It is no coincidence that the European Commission and France are also working on the development of such a labelling system, in the case of the latter, with the latter even considering its mandatory introduction (Deconinck and Hobeika, 2022).

During the introduction, it is worth emphasising that this label and logo should not only be taken into account by consumers with an environmentally friendly attitude but, based on Czarnecki et al. (2018), it should also be able to involve broad consumer groups through social norms and personal, immediate benefits. Therefore, it is also worth highlighting in communications that, based on research and the experiences of other countries, a wide range of consumers take similar labels into account when making purchasing decisions, and that there are other individual benefits, such as financial savings or healthier food choices. It is particularly worth focusing on health, for which a substantial amount of scientific research is available, as presented earlier in Subchapter 2.2.

4.1.6 Restructuring of state advertising and marketing subsidies

The current domestic and EU public policy favours producers of animal-based products (the meat and dairy industries) not only through production-linked and land-based subsidies, but also through marketing subsidies related to finished products.

While, as presented in Chapter 2, a reduction in the consumption of meat and dairy products would be desirable from environmental, health and animal welfare perspectives, both at the EU and domestic levels public funds are used to subsidise marketing campaigns aimed at increasing or at least maintaining the consumption of meat and dairy products (Eräjää, 2021). Of course, it is not only advertisements promoting the consumption of meat and dairy products that are funded by public money; in some cases, there are also campaigns promoting the consumption of fruit and vegetables. However, based on Eräjää (2021), between 2016 and 2020, 32% of the amount spent by the EU on promoting agricultural products was spent exclusively on meat and dairy products, and 28% was spent on advertising multi-product consumer baskets, almost all of which contained meat and dairy products. In contrast, only 19% of the budget was spent on encouraging the consumption of fruit and vegetables.

Recent data also show that the EU is spending an increasing amount on the advertising of meat and dairy products, with a 14% increase in 2024 compared to 2023.⁷²

Eräjää (2021) provides examples from various EU Member States of EU-funded programmes run between 2016 and 2020 to promote the consumption of meat and dairy products. There are plenty of examples of this in Hungary in recent years:

⁷² <https://www.nieuweoogst.nl/nieuws/2025/07/29/europese-subsidies-vlees-en-zuivelreclames-stijgen-weer> (in Dutch only, retrieved: 30 July 2025)

- Since 2013, a campaign to encourage pork consumption has been running every year, organised by the state-owned Agricultural Marketing Centre, which may have contributed to the increase in domestic pork consumption to some extent.⁷³ The campaign was timed for May 2025, the start of the barbecue season.⁷⁴
- In recent years, there have been several campaigns to encourage the consumption of lamb meat, also organized by the Agricultural Marketing Centre.⁷⁵
- Campaigns to encourage milk consumption have also been run several times in Hungary in recent years,⁷⁶ and the Milk Interprofessional Organization and Product Board receives substantial state subsidies every year (HUF 90 million in 2022, HUF 117 million in 2023⁷⁷), part of which is also spent on consumption promotion and “education” campaigns, in many cases targeting school-age children.

It is almost impossible to estimate the direct impact of these campaigns on consumption, but they have certainly contributed to some extent to the growing consumption trends described in Subchapter 2.4.

Intervention. Ending campaigns promoting meat and dairy consumption financed by Hungarian and EU public funds as soon as possible would be a simple and minimally necessary step in times of climate crisis on a continent that wants to lead the world in sustainability and be the first to become carbon neutral. Instead of these campaigns, the available financial resources should be used to promote plant-based products and diets. This shift would certainly have a positive impact on making domestic food consumption more sustainable and would also contribute to reducing methane emissions, not to mention the beneficial health effects.

Expected effects. Although it is almost impossible to estimate the exact or even approximate impact of advertising, these advertisements may have played a role in the increase in domestic meat and dairy consumption described in Subchapter 2.4. In addition, the results of Ellithorpe et al. (2022) also support the idea that advertisements depicting meat encourage meat consumption: participants exposed to such advertisements had a significantly greater desire to consume meat than those who saw advertisements that did not depict meat.

Communication. The vast majority of consumers are basically unaware of who is funding an advertising campaign, so from the consumer side, the only visible change would be a decrease in the number of campaigns promoting meat and dairy consumption and an increase in the number of campaigns aimed at increasing the consumption of plant-based foods. In making this shift, it is important to ensure that the messages of the campaigns are realistic and credible and do not completely contradict consumers' deep-rooted beliefs. It is important to highlight the positive health effects of these products in the campaigns and to emphasise them with the involvement of credible experts.

From this point of view, Upfield's (now Flora Food Group) “Skip the cow” advertisement was probably too progressive for Hungarian society (for more details, see Subchapter 5.1),

⁷³ <https://kap.gov.hu/news/2024-12-03/161253/fejlesztesi-programok-biztositjak-magyar-sertesagazat-jovojet> (in Hungarian only, retrieved: 10 June 2025)

⁷⁴ <https://www.amc.hu/belpiaci-hirek/elinditotta-fogyasztasosztongo-kampanyat-az-agrarmarketing-centrum/1441/> (in Hungarian only, retrieved: 10 June 2025)

⁷⁵ <https://www.amc.hu/belpiaci-hirek/baranyhus-fogyasztasosztongo-kampanyt-indit-az-agrarmarketing-centrum/1439/> (in Hungarian only, retrieved: 10 June 2025)

⁷⁶ <https://kormany.hu/hirek/tejfogyasztast-nepszerusito-kampany-indul> (in Hungarian only, retrieved: 10 June 2025)

⁷⁷ See the annual accounts: <https://tejtermek.hu/beszamolok> (in Hungarian only, retrieved: 10 June 2025).

while the Smart Protein campaign (<https://okosfeherje.hu/>)⁷⁸ launched by the Hungarian Association of Plant-Based Food Producers and Distributors is likely to resonate strongly with the mindset and worldview of domestic consumers, meaning that the latter type of campaign should be supported by the state.

4.1.7 Extension of the School Milk Scheme

At present, certain nursery and primary school students receive fresh vegetables, fruits and milk, as well as dairy products, partly from EU and partly from Hungarian state subsidies. Currently, approximately 635,000 children participate in the program in Hungary.⁷⁹ The nursery and school milk programme is regulated by EU regulations,⁸⁰ and during the most recent review, several professional organisations and businesses lobbied for the inclusion of plant-based drinks in the programme, considering sustainability aspects and those who are sensitive to milk protein.⁸¹ Unfortunately, however, the proposal failed.⁸²

Intervention. Although plant-based drinks are not eligible for funding under the EU-subsidised School Milk Scheme, they could be provided through a Hungarian state subsidy. To this end, it is necessary to amend AM Decree 19/2021. (V. 5.) on the regulation of the nursery and school milk program, primarily by expanding Section 4 to include plant-based drinks (rice, soy, oat, and almond drinks) that do not contain added sugar and are enriched with calcium and other vitamins, and possibly soy-based fruit yoghurt alternatives.

Expected effects. In the 2023/2024 school year, 4.4 million litres of milk, 1.9 million kg of flavoured milk products and 0.2 million kg of dairy products without added sugar were distributed in Hungarian nurseries and schools within the framework of the School Milk Scheme.⁸³ At the same time, this is only 0.3–0.4% of domestic milk production.⁸⁴ The measure would reduce the amount of milk distributed within the framework of the School Milk Scheme to some extent, as some children would choose plant-based drinks, but this would not have a substantial impact on national milk production and consumption. In the longer term, however, it would have a positive impact on the eating habits and sustainability awareness of the younger generation if they were exposed to plant-based alternatives at an early age and these appeared as natural as possible to them. However, the impact of this cannot be quantified.

Communication. The proposed amendment would not only promote sustainability goals, as alternative, less environmentally polluting products would be introduced to young children from an early age, but children with milk protein sensitivity would not be excluded from the programme, and children would have the choice of what they would prefer to consume, milk or plant-based drinks. It is especially important to emphasize in communication that the most common food allergy in childhood is milk protein sensitivity (Pálfi, 2019), which can only be treated with a strict diet, so these children currently suffer a substantial disadvantage because

⁷⁸ In Hungarian only, retrieved: 10 June 2025.

⁷⁹ <https://agridata.ec.europa.eu/extensions/SchoolSchemeMonitoring/SchoolSchemeMonitoring.html> (retrieved: 7 July 2025)

⁸⁰ https://agriculture.ec.europa.eu/common-agricultural-policy/market-measures/school-scheme-explained_en (retrieved: 7 July 2025)

⁸¹ <https://plantbasedfoodseurope.eu/euschoolscheme/> (retrieved: 7 July 2025)

⁸² <https://www.forbes.com/sites/danieladelorenzo/2023/05/09/more-budget-and-milk-options-for-the-eu-schools-food-scheme-agrees-the-european-parliament/> (retrieved: 7 July 2025)

⁸³ <https://agridata.ec.europa.eu/extensions/SchoolSchemeMonitoring/SchoolSchemeMonitoring.html> (retrieved: 7 July 2025)

⁸⁴ https://www.ksh.hu/stadat_files/mez/en/mez0056.html (retrieved: 7 July 2025)

the state does not provide them with healthy food that they can consume within the framework of the School Milk Scheme.

4.1.8 Summary assessment of the potential government interventions

In the previous subchapters, we presented a total of seven potential government interventions that could result in a more sustainable food consumption structure and reduce the emissions of related greenhouse gases, especially methane. These covered all levels of the supply chain: from the restructuring of the subsidy system for raw material production, through the reduction of industrial consumption and the restructuring of consumption-based taxes, to advertising and consumer education. In this subchapter, we review these from the point of view of two aspects: the expected impact and the expected social perception and support of the intervention.

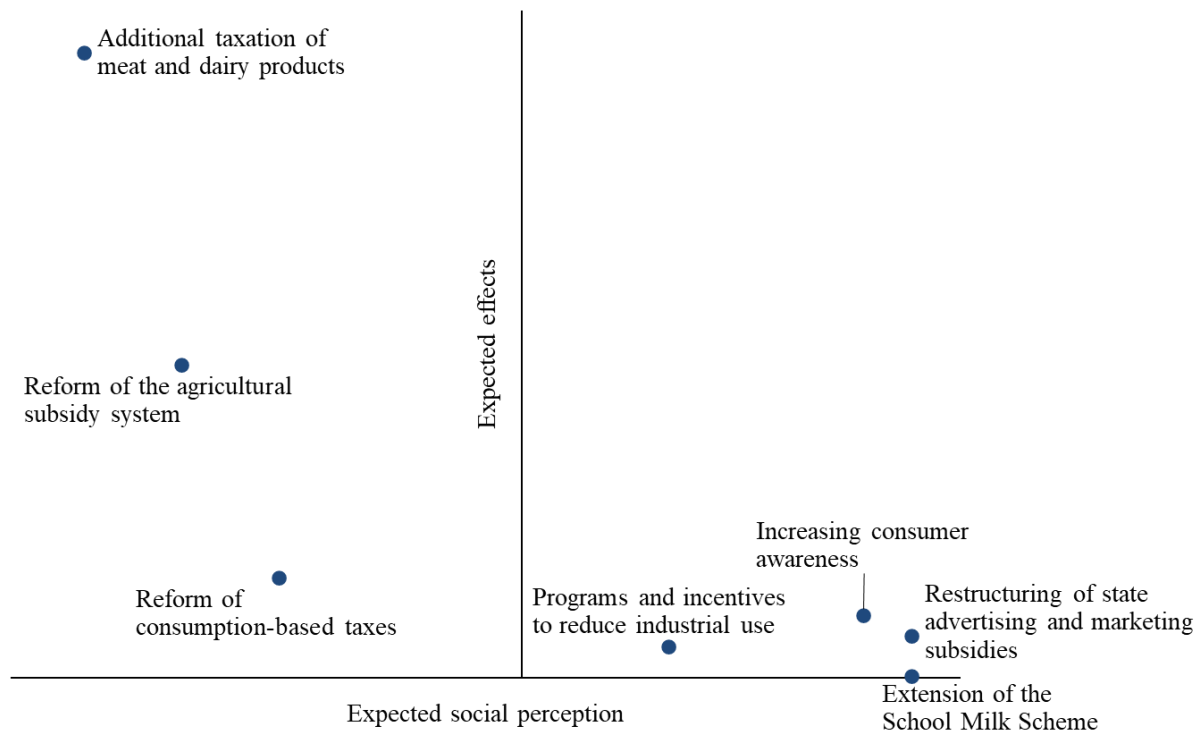
According to a literature review by Bryant et al. (2024), more intensive taxation of animal-based products is typically less supported in society than subsidies for plant-based products. In addition, interventions that only indirectly affect consumers are easier to implement than those that require a change in consumption patterns. Finally, the number of lactose- and milk protein-intolerant people is increasing worldwide and in Hungary as well. It is difficult to find exact data on this, but according to a Nielsen survey,⁸⁵ 5% of the population follows a lactose- or dairy-free diet in Europe, while according to the data of the HCSO,⁸⁶ 3.5–4.5% and 1–2% of the population followed a lactose- and milk protein-free diet in Hungary in 2019, respectively. The replacement of milk and dairy products in certain finished products thus provides meaningful help for them, which may be an additional consideration when assessing the public support for certain benefits.

Figure 11 was compiled based on these considerations and the impact assessments presented in the individual subchapters.

⁸⁵ <https://www.statista.com/statistics/597395/lactose-or-dairy-free-diet-followers-worldwide-by-region/> (retrieved: 10 June 2025)

⁸⁶ https://www.ksh.hu/docs/hun/xftp/idoszaki/elef/taplalkozas_2019/index.html (in Hungarian only, retrieved: 8 July 2025)

Figure 11. Evaluation of the seven possible interventions in terms of expected impact and social perception



Source: own summary.

Based on the figure, it is clear that the restructuring of advertising subsidies, increasing consumer awareness and expanding the School Milk Scheme with plant-based drinks are likely to have the highest public support, while interventions with direct financial effects have the lowest support. However, these can be mitigated if the interventions become fiscally neutral, so that rising prices are offset by increasing transfers or decreasing levies, as has also been assumed in some modelling (e.g. Edjabou and Smed, 2013). In this regard, we present several successful examples in Subchapter 6.3. However, the strong pro-meat and pro-milk attitude of Hungarian society (discussed in more detail in Chapter 5) may lead to a negative assessment of rising prices for meat and dairy products, even if the individual financial balance is positive, as these are generally considered healthy and are the basic ingredients of traditional Hungarian cuisine.

Unfortunately, it is not only true for the Hungarian society that they do not easily switch from meat and dairy to alternative protein sources. Based on a literature review by Onwezen et al. (2025), reducing meat consumption encounters strong obstacles, primarily related to identity and morality, while switching to a plant-based diet often faces practical obstacles (habits, tastes, cooking techniques). Resistance is particularly strong among heavy meat consumers. This also makes it difficult to implement public policies that are desirable from a sustainability and methane emissions perspective, as politicians often fail to take action due to the anticipated resistance. Nevertheless, based on the literature review, it is positive that consumer resistance shows a decreasing trend over time and is often overestimated. However, its proper management requires strategies that also take into account cultural, social and contextual factors.

Table 3 summarises the risks associated with each intervention, the steps that can be taken to mitigate those risks, and the positive messages that can be formulated which, even if

they do not directly address the concerns raised, are at least capable of increasing public support for the intervention and reducing resistance. In the case of positive messages, we did not include methane emission reduction and environmental sustainability in general, as these apply to all interventions.

Table 3. Risks of the proposed interventions, risk mitigation steps and positive messages to increase public support for the intervention

Intervention	Identified risks	Risk mitigation measures	Positive messages
Reform of the agricultural subsidy system	<ul style="list-style-type: none"> - Dissatisfaction and protests by agricultural producers (farmers) and interest groups - Rising unemployment in rural areas - Social discontent due to rising meat and dairy prices - Increasing imports of meat and dairy products, growing foreign exposure 	<ul style="list-style-type: none"> - Restructuring programmes - Subsidies for farmers who cease production - Coordination for simultaneous restructuring across the EU - Increase the subsidy intensity of vegetables, fruits and legumes - Direct financial transfers 	<ul style="list-style-type: none"> - Facilitating the adaptation of domestic agriculture to changing climatic conditions - Only underpaid⁸⁷ jobs will be eliminated, which could only be filled by temporary workers from developing countries anyway⁸⁸ - Decrease in the price of healthy foods due to increased subsidies - In addition to environmental benefits, beneficial health effects are also expected (Cleghorn et al., 2022) - Strengthening social justice and reducing inequalities by reforming the system that subsidises the rich
Programs and incentives to reduce industrial use	<ul style="list-style-type: none"> - Dissatisfaction and protests by agricultural producers (farmers) and interest groups - Raising health concerns (processed food, hydrogenated margarine, etc.) - The products will taste worse 	<ul style="list-style-type: none"> - Restructuring programmes - Subsidies for farmers who cease production 	<ul style="list-style-type: none"> - Increasing the range of products available to lactose- and milk protein-intolerant people, while reducing the price level - Numerous studies confirm that healthier ingredients are being used

⁸⁷ Livestock farming is typically underpaid, and the average gross earnings of those working in this sector have been between 80% and 85% of the average wage in the national economy over the past six years (<https://stainfo.ksh.hu/Stainfo/QueryServlet?ha=LG2001TT>, retrieved: 9 September 2025).

⁸⁸ According to the 2022 publication of AKI (<https://www.aki.gov.hu/termek/az-agrarszakkepzes-szerepe-a-munkacro-utanpotlasban-2022/>, in Hungarian only, retrieved: 10 June 2025), one of the biggest problems in the livestock farming sector at the national level is the lack of labour.

Reducing methane emissions by cutting dairy and meat consumption in Hungary

			<ul style="list-style-type: none"> - A large part of the butter consumed in Hungary is imported, so import exposure will decrease - Numerous product tests confirm that there is no noticeable difference in taste, and the switch will be voluntary anyway
Reform of consumption-based taxes	<ul style="list-style-type: none"> - Dissatisfaction and protests by agricultural producers (farmers) and interest groups - Rising unemployment in rural areas - Social discontent due to rising meat and dairy prices - Unfavourable dietetic and policy opinions (protein and energy intake will decrease, which can lead to public health problems) - Decline in food security 	<ul style="list-style-type: none"> - Restructuring programmes - Subsidies for farmers who cease production - Overall, implementation of a tax reform that is neutral for the state - Lump sum, freely usable compensation for all Hungarian citizens 	<ul style="list-style-type: none"> - Due to the compensation, the vast majority of citizens will be better off and will still be able to buy the same basket of goods as before, so food security will not be endangered - Strengthening social justice and reducing inequalities - Reduction in the (relative) price of healthy foods - Only underpaid jobs will be eliminated, which could only be filled by temporary workers from developing countries anyway - According to public health research (e.g. GBD) and recommendations (e.g. EAT–Lancet), meat and dairy consumption is already high in Hungary, and a reduction would have positive health effects (Cleghorn et al., 2022)

Reducing methane emissions by cutting dairy and meat consumption in Hungary

			<ul style="list-style-type: none"> - Fruit and vegetable consumption is below the desired level, and the tax change aims to increase this
<p>Additional taxation of meat and dairy products</p>	<ul style="list-style-type: none"> - Dissatisfaction and protests by agricultural producers (farmers) and interest groups - Rising unemployment in rural areas - Social discontent due to rising meat and dairy prices - Unfavourable dietetic and policy opinions (protein and energy intake will decrease, which can lead to public health problems) - Decline in food security 	<ul style="list-style-type: none"> - Restructuring programmes - Subsidies for farmers who cease production - Overall, implementation of a tax reform that is neutral for the state - Lump sum, freely usable compensation for all Hungarian citizens 	<ul style="list-style-type: none"> - Due to the compensation, the vast majority of citizens will be better off and will still be able to buy the same basket of goods as before, so food security will not be endangered - Strengthening social justice and reducing inequalities - Only underpaid jobs will be eliminated, which could only be filled by temporary workers from developing countries anyway - According to public health research (e.g. GBD) and recommendations (e.g. EAT–Lancet), meat and dairy consumption is already high in Hungary, and a reduction would have positive health effects (Cleghorn et al., 2022) - The revision of the public health product tax follows international recommendations
<p>Increasing consumer awareness</p>	<ul style="list-style-type: none"> - Dissatisfaction and protests by agricultural producers (farmers) and interest groups - The applied evaluation system is built in a distorted way, achieving the opposite goal 	<ul style="list-style-type: none"> - Appointing a committee comprising professionally credible, recognised foreign researchers to develop a mandatory methodology 	<ul style="list-style-type: none"> - Access to credible information will be ensured - Freedom of choice is given to everyone

Reducing methane emissions by cutting dairy and meat consumption in Hungary

		- Adoption of international best practices	
Restructuring of state advertising and marketing subsidies	- Dissatisfaction and protests by agricultural producers (farmers) and interest groups	- More subsidies for advertisements promoting the consumption of vegetables, fruit and legumes	- The state does not distort market conditions and creates a level playing field, as is its duty - Subsidies are shifted to advertising that promotes the consumption of product categories that are most under-consumed compared to public health/dietary recommendations (vegetables, fruit, legumes and nuts and seeds), which is logical from a health perspective
Expansion of the School Milk Scheme	- Dissatisfaction and protests by agricultural producers (farmers) and interest groups - Unfavourable dietetic and policy opinions (protein and energy intake will decrease, which can lead to public health problems)	- Products included in the programme should not contain added sugar or sweeteners	- The change only expands the range of available products; it does not take anything away - The programme will become more inclusive, and people with milk protein intolerance will not be excluded - It ensures freedom of choice for children and their parents

Source: own summary.

For each of the proposed interventions, there are therefore positive messages that can be communicated to society to increase support for the interventions. In many cases, however, it is crucial that farmers are also reassured, feel that they are important, and that the government is securing their future. For this reason, we discuss the possible restructuring subsidies and their implementation methods in detail in Subchapter 4.1.9.

Finally, we consider it important to note that although any of the seven interventions presented can be implemented independently, their effects can reinforce each other, so they can have positive synergistic effects if the government implements several or even all of them at the same time. The reason for this is that complex measures that include financial, educational and marketing elements are usually more successful, for example, in the case of public health programs (Berezvai et al., 2024).

4.1.9 Restructuring programme for meat and dairy farmers

In the case of the potential government interventions presented, it was mentioned several times that a state subsidy programme needs to be developed for agricultural producers, especially beef, pig and dairy farmers, to help them stop production or switch to producing other products. Since methane emissions are not generated when meat and dairy products are consumed, but when they are produced, the country's methane emissions can only be reduced if meat and dairy production also decreases. A reduction in consumption is necessary to ensure that the response to a decline in domestic production is not an increase in imports, as this does not fundamentally reduce methane emissions at the global level, but merely shifts them. A simultaneous decrease in supply and demand is required.

At the same time, a reduction in production necessarily means that there will be some of the current producers who will be forced out of the market, putting their livelihoods and investments at risk, and therefore they will oppose the interventions. If we can present a positive and prosperous vision for beef, pig and dairy farmers, they will be more likely to support changes. Their expected resistance will decrease, and they may even become supporters.

In this subchapter, we will explore what such a restructuring programme can look like and what costs should be expected, and we will also present similar programmes from the past.

4.1.9.1 Previous restructuring and production cessation programmes

When the competitive situation of industries has changed, demand has fallen, environmental considerations have arisen, or major epidemics have occurred, programmes and initiatives have been launched on several occasions with the aim of encouraging some producers to stop growing certain crops or breeding certain animal species. Such programmes are therefore not without precedent.

One of the best-known cases, which also affected Hungary, was the reform of the EU sugar regime that began in 2006, which aimed to reduce production volumes by 30%, as according to the European Commission's calculations, this would have brought the market into balance. To achieve this, a restructuring fund was set up from the producers' contributions paid on their sugar quotas, which financed three objectives:

- Firstly, compensation was provided to sugar factories that ceased operations, 10% of which was reserved for sugar beet growers and their machinery suppliers.
- Secondly, diversification aid was provided in regions affected by restructuring to enable producers to switch to other crops.

- Thirdly, transitional aid was granted to factories dealing exclusively with sugar refining to enable them to adapt to restructuring.

The estimated total expenditure of the restructuring fund was EUR 5.6 billion (2010 value), which is roughly EUR 7.9 billion⁸⁹ (HUF 3,160 billion) in today's terms. Of this, the part relating to Hungary was EUR 312 million (EUR 439 million or HUF 176 billion at today's value).

Producers ceasing production had to develop a restructuring plan, which included a social plan (essentially retraining the workforce), an environmental plan, a business plan (modalities, timetable and costs of factory closure and dismantling) and a financial plan. As a result of the programme, 28% of the previous sugar quotas were returned in the EU and 74% in Hungary, with only the Kaposvár sugar factory remaining (European Court of Auditors, 2010).

A more recent example is the Dutch measure to reduce nitrogen pollution, which aimed to reduce livestock farming in Natura 2000 classified areas. In 2019, the Dutch Supreme Court (Raad van State) found that the measures taken to reduce nitrogen emissions were insufficient and that the permits issued were contrary to the relevant EU directive. As livestock farming generates substantial nitrogen emissions, it became inevitable that these would also have to be reduced (Siegmann, 2024). The Dutch government was relatively slow to act, but in 2023 two programmes were launched with a total value of EUR 1.47 billion (approximately HUF 588 billion), the aim of which was to compensate dairy, pig and poultry farmers who permanently ceased their activities for their losses incurred. In some cases, producers could also receive compensation of up to 120% of the adjusted replacement value of their production capacity to be terminated, thus incentivising the abandonment of production. In exchange for the subsidy, producers had to undertake not to restart breeding of the same animal species anywhere in the EU.⁹⁰

Finally, a recent example in Hungary. In 2025, in response to various animal diseases that are becoming increasingly serious, the Hungarian agricultural administration also launched a subsidy programme in the waterfowl sector in order to reduce the density of livestock farms (AM Decree 22/2025. (VI. 13.)). Under the programme, with a budget of more than HUF 2 billion, subsidy was granted to producers (natural persons or micro-enterprises) who undertook to suspend production for at least three years, not to keep any poultry on the site in question or in areas severely affected by avian flu, and not establish any new waterfowl farms anywhere in the country.⁹¹ The subsidy was based on the size of the livestock barn.

4.1.9.2 The framework and costs of a possible restructuring programme for dairy and meat production in Hungary

In line with the climate protection goals and the 30% methane emission reduction expected by the project, the structural change program also expects to reduce the current domestic beef, pig and dairy production by 30%.

At present, about two million litres of cow's milk are produced annually in Hungary,⁹² as well as 300,000 tonnes of pork and 25,000 tonnes of beef.⁹³ At the end of 2024, the total

⁸⁹ Eurostat data (<https://ec.europa.eu/eurostat/databrowser/bookmark/f34c87ea-2404-4eae-8165-4de5a0a40ff9?lang=en&createdAt=2025-09-29T22:01:55Z>, retrieved: 29 September 2025).

⁹⁰ https://ec.europa.eu/commission/presscorner/detail/en/ip_23_2507 (retrieved: 10 June 2025)

⁹¹ <https://www.agrarszektor.hu/allat/20250428/fizet-az-allam-a-gazdaknak-ha-abbahagyjak-a-termelest-55114> (in Hungarian only, retrieved: 10 June 2025)

⁹² https://www.ksh.hu/stadat_files/mez/en/mez0034.html (retrieved: 18 September 2025)

⁹³ https://www.ksh.hu/stadat_files/mez/en/mez0033.html (retrieved: 18 September 2025)

livestock population was 861,000 cattle (including 406,000 cows) and 2.8 million pigs.⁹⁴ The goal is therefore to reduce the cattle population to 603,000 and the pig population to 2 million.

Within the framework of the restructuring programme, the aim must therefore be to reduce the cattle population by 258,000 (including 122,000 cows) and the pig population by 800,000. Financial planning should be adjusted accordingly and the programme must be announced in accordance with this framework. When designing the programme, it is worth taking into account the similar Hungarian and Dutch programmes described in the previous subchapter (the detailed documentation of the latter is available on the website of the European Commission⁹⁵).

Based on these, the proposed programme should provide subsidies to livestock farmers who have been breeding the given animal species for at least a certain period of time (e.g. two or five years), have not made any substantial improvements for a certain period of time (e.g. also two or five years),⁹⁶ are still active at the time of submitting the aid application, and are permanently and irreversibly ceasing this activity, i.e.:

- the keeping of farm animals on the given farm to be closed down is discontinued;
- no other farm may keep the same animal species;
- buildings and equipment used for livestock farming on the given farm are dismantled, decommissioned or demolished;
- undertakes not to resume the breeding of the animal species in question either domestically or in another EU Member State for a period of ten years following the payment of the aid.

Livestock farmers who accept the conditions can receive two types of compensation:

- the programme will reimburse their investments in breeding the species concerned, taking into account the adjusted replacement value of production capacity on the basis of the two similar programmes mentioned above;
- the closure of the given farm, the dismantling and demolition of the equipment may entail additional costs, which requires the development of a financial plan and its financing after an audit.

The most important factor in estimating the cost of the program is determining the replacement value of production capacity. The essence of this is to determine the replacement value of the equipment used by the producer in question. This is obviously higher than their current book value, as a tool in use depreciates, i.e. it loses value during use, but it can still be used for the same production purpose. However, in the event of replacement, the tool must be repurchased at its market price. At the same time, due to the continuous development of machinery and technology, replacing an older machine/asset is cheaper than purchasing the latest similar asset. For this reason, we approach the determination of the replacement value of production capacity in two ways, and the actual value is expected to lie between these two values. On the one hand, AKI FADN data contain the average size of fixed and current assets (per livestock unit) in the various livestock sectors (Table 4). This can be a good starting point, but the accounting value of existing fixed assets is typically lower than their replacement value.

⁹⁴ https://www.ksh.hu/stadat_files/mez/en/mez0027.html (retrieved: 29 September 2025)

⁹⁵ https://ec.europa.eu/competition/state_aid/cases1/202324/SA_106555_40E9AF88-0000-C4FB-AE3C-835D39FC4CEC_67_1.pdf and https://ec.europa.eu/competition/state_aid/cases1/202324/SA_106559_A0EEAF88-0000-CBF7-AD91-F8F52D6CA15E_76_1.pdf (retrieved: 18 September 2025)

⁹⁶ The purpose of this provision is to prevent the closure of the most modern and efficient livestock farms, as these are likely to be more environmentally efficient.

Table 4. Average fixed and current assets of Hungarian livestock farms in 2023

Animal species	Fixed assets of existing farms (HUF thousand/livestock unit)	Current assets of existing farms (HUF thousand/livestock unit)
Pig	238.16	135.38
Beef cattle	2,144.88	951.42
Dairy cattle	2,070.19	1,289.55

Note: one pig is converted as 0.2 livestock unit.

Source: own calculation based on AKI FADN data (<https://adat.aki.gov.hu/Diagram/FADN/AllattartoGazdasagokPenzugyiAdataiMerlegadatok?topmenucode=%2fAgazati%2fAllattenyesztes&code=%2fDiagram%2fFADN%2fAllattartoGazdasagokPenzugyiAdataiMerlegadatok&menuitemid=c42361e8-77f0-4273-b6d6-4e074ac0ac67&Lang=En>, retrieved: 28 September 2025).

On the other hand, we also determined the unit cost of recently completed new investments, which overestimates the replacement value, as the establishment of a completely new livestock farm equipped with the latest technology requires a larger investment than the replacement cost of an older farm. Based on an online search, Table 5 summarises data on newly completed investments. Based on these, it can be seen that the provision of a place in a dairy farm costs approximately HUF 4–4.5 million, while building a floor area of approximately one m² in a pig farm costs HUF 350,000–450,000, depending on the function of the farm.

Table 5. Investment data of recently completed livestock farms

Company, location	Total investment cost (HUF million)	Capacity (individual)	Annual capacity (individuals)	Floor area (m ²)
Cattle (dairy farming)				
Nagisz-Tej Kft., Nádudvar	5,000	1,104	-	-
Darnózséli Agrár Zrt., Darnózséli	2,000	498	-	-
Pig				
Hajdúsági Agráripari Zrt., Békéscsaba	5,900	-	25,000	14,000
Hajdúsági Agráripari Zrt., Hajdúszoboszló	3,400	8,640	-	10,000
FirstFarms Hungary Kft., Telekgerendás and Pusztaföldvár	8,000	-	-	18,500

Source: <https://nagisz.hu/hirek/ultramodern-szarvasmarhatelepet-adott-at-a-nagisz-nadudvaron>, <https://www.kisalfold.hu/helyi-gazdasag/2023/11/kozeli-ketmilliard-forintbol-fejlesztettek-a-darnozseli-teheneszeti-telepet>, <https://www.agrarszektor.hu/vallalkozas/20230920/gigaberuhazas-magyarorszagon-hatalmas-sertestelep-epult-bekescsaban-45245>, <https://www.magro.hu/hu/agrahirek/cikk/tobb-milliardos-sertestelep-fejleszt-es-fejzodott-be-csanyi-sandor-cegcsoportjaban-videoval/>, <https://uzletem.hu/mezogazdasag/8-milliardos-beruhazas-14-honap-alatt-keszultek-el-a-sertestelepek> (in Hungarian only, retrieved: 28 September 2025)

Based on the comparison of the two methodologies, it can be seen that in the case of cattle farming, the subsidy requirement of approximately HUF 3,500,000/animal is required, while in the case of pig farming, the subsidy requirement is HUF 300,000/m². The basis for accounting may therefore differ between the two sectors. The reason for this is that the lifecycle of cattle (especially in milk production) is much longer, so in their case it makes sense to determine the decrease on an individual basis, while in the case of pigs, the floor area of the farm is the determining factor and is easy to quantify, as a pig reaches slaughter weight in about six months, but sows require separate housing.

Based on the above, a budget of HUF 903 billion is required to achieve the desired reduction in cattle numbers, while HUF 134 billion is required to achieve the desired reduction in pig numbers. On top of this is the cost of liquidating the farms, which, based on the Dutch example,⁹⁷ amounts to an additional HUF 30 billion for cattle (calculated at EUR 45 (approximately HUF 18,000) per square metre, and 6.5 m²/capacity⁹⁸) and HUF 8 billion for pigs. The total estimated cost of the programme is therefore HUF 1,075 billion, which is comparable to Hungary's total annual agricultural subsidies (see Chapter 3), but slightly less.

4.2 POTENTIAL CORPORATE INTERVENTIONS

After reviewing the possible government interventions to reduce methane emissions through reducing meat and dairy consumption, we will also present some interventions that individual companies can take, regardless of government involvement. The identified interventions may affect different groups of companies: some interventions are relevant for meat and dairy companies, others for retailers, while some of them are relevant for manufacturers of plant-based products.

4.2.1 Using behavioural economics to change consumer habits

The aim of behavioural economics is to understand human behaviour as accurately as possible and to use this knowledge to make various public policy interventions as successful as possible. Over the years, a wealth of knowledge has been accumulated on how to successfully influence consumer behaviour and decisions, steering them in a more sustainable direction, for example by shaping choice options and selecting default options (Sunstein and Reisch, 2014; Singh et al., 2024). However, Szaszi et al. (2025) point out that the effectiveness and success of these interventions are highly context-dependent and often difficult to predict. It is therefore necessary to examine the conditions under which a given intervention works well, including moderators and environmental factors, before implementing any intervention. For this reason, this subchapter of the study presents interesting and proven interventions from the retail and hospitality sectors that retailers and hospitality establishments can use to encourage the shift towards plant-based foods. In addition, Subchapter 6.6 presents further successful (real-life) examples.

4.2.1.1 Options for retailers

In modern societies, such as Hungarian society, a large proportion of consumers purchase their food from discount stores, supermarkets and hypermarkets, rather than from markets or directly from producers. The retail sector is highly concentrated globally and in Hungary, with the

⁹⁷ https://ec.europa.eu/competition/state_aid/cases1/202324/SA_106559_A0EEAF88-0000-CBF7-AD91-F8F52D6CA15E_76_1.pdf (retrieved: 29 September 2025), para. 21.

⁹⁸ <https://www.agraroldal.hu/szarvasmarha-telep.html> (in Hungarian only, retrieved: 29 September 2025).

aggregate market share of the 10 largest grocery retail chains in Hungary being around 80% (Berezvai and Kónya, 2025).

Large grocery retail chains have substantial market power over their suppliers and are also able to influence consumers' food choices. This market position can be exploited to achieve sustainability objectives.

On the one hand, retailers have the ability to influence product offerings and product composition, thus forcing their suppliers to use more sustainable raw materials (see Subchapter 4.1.2). This is especially true in the case of private label products, but a sufficiently large retailer can also achieve changes in terms of manufacturer-branded products, especially in the case of smaller manufacturers.

On the other hand, retailers can also promote more sustainable, meat- and dairy-free food choices in various ways. The results of behavioural economics can provide some clues in this. McRae and Dubé (2024) investigated the effects of different promotions on the demand for plant-based foods in Canada. Based on their results, the most effective is the appearance in advertising leaflets, which has a significant attention-grabbing effect and frequency, and can be close to the purchase in time. The authors emphasise that placing advertising leaflets at the entrance to stores and labelling plant-based products on sale on the shelves can help consumers choose more sustainable products at critical moments of decision-making. In addition, promotions offering bonus loyalty points are the most effective way to increase demand, but frequent promotions also increase price sensitivity, and consumers can get used to discounted prices. That is why it is worth avoiding excessive promotion of plant-based products, and in the long run, lowering the baseline price may help to maintain demand levels.

4.2.1.2 Options for hospitality establishments

Hospitality establishments and events can also have a substantial impact on the choice of plant-based foods and the popularisation of these foods. In addition, the hospitality industry itself uses a large amount of meat and dairy, the reduction of which would also contribute to reducing methane emissions. Zhang et al. (2024) examined the effects of changing the default menu at a total of six events at four universities. Based on their results, participants were 43 percentage points more likely to choose a plant-based menu (as opposed to one containing meat) if it was the default. A similar result was reached by Gravert and Kurz (2021). Based on their randomised controlled experiment, if vegetarian and vegan dishes were highlighted on the restaurant menu, significantly more people chose them over meat-containing dishes. 15% of the dishes sold were vegetarian when these dishes were highlighted on the menu, and only 3.5% when the menu simply mentioned that vegetarian/vegan options were available. These results suggest that offering default options and framing choices has a substantial impact on how widespread meat- and dairy-free foods are, and how much methane emissions can be saved.

4.2.2 Preferential pricing of plant-based products, voluntary profit restrictions

Several international retail chains have made it part of their sustainability policy to reduce the sale of animal-based foods and promote the spread of plant-based products.⁹⁹ In January 2025,

⁹⁹ Lidl: <https://bcsdh.hu/en/member-news/lidl-strengthens-its-international-commitment-to-conscious-nutrition-together-with-wwf/> (retrieved: 7 July 2025); Aldi: <https://sustainability.aldisouthgroup.com/focus-areas/healthy-nutrition> (retrieved: 7 July 2025).

Lidl,¹⁰⁰ Spar,¹⁰¹ and dm¹⁰² supported the Veganuary campaign in various ways, encouraging their consumers to try plant-based foods and incorporate them into their diets.

In addition to advertising and promotions, the pricing of products is of paramount importance, and progress has also been made. For example, since the beginning of 2024, Lidl has set the prices of some plant-based products in line with the prices of similar products of animal origin.¹⁰³ However, the prices of plant-based products are still typically higher than those of similar animal-based products, and higher retail margins also play a role in this. Based on the results of the accelerated sectoral inquiry carried out by the GVH in 2025,¹⁰⁴ the retail margin on oat drinks is, on average 78% higher than that of fresh milk with 1.5% fat content, the retail margin on soy-based yoghurt alternatives is, on average 219% higher than that of natural yoghurt, and the retail margin on plant-based sour cream alternatives is, on average 47% higher than that of sour cream with 20% fat content. In addition, based on the experience of the government-mandated margin reduction, the margin of margarine was also much higher than that of butter, as the prices of margarines decreased more than the prices of butter.¹⁰⁵

The higher margins on plant-based products can be partly explained by lower demand and turnover rates (although this is not the case for margarine, for example¹⁰⁶), but these factors are nevertheless unfavourable from a sustainability perspective. If a retail chain were to reduce its profit margin on several plant-based products, the more favourable prices would make these products accessible and attractive to more consumers, thereby increasing consumption and likely encouraging more consumers to try these products.

4.2.3 Replacing dairy products and animal fats in recipes

In Subchapter 4.1.2, we presented the framework of a government programme aimed at reducing the use of milk, dairy products and animal fats in food processing plants. This requires some degree of reformulation of recipes and testing of new ingredients. However, more and more products are appearing on the market (see the butter alternatives presented in Subchapter 4.1.2.2) that perfectly replace dairy products or animal fats in terms of taste and use, making the transition easy and inexpensive.

Companies can therefore unilaterally decide to replace dairy products (primarily milk and butter) and animal fats with plant-based alternatives in their products. This allows them to reduce the environmental footprint of their products while maintaining their quality and, in the case of replacing dairy products, to increase their potential customer base (as their products become suitable for consumption by people with milk intolerance).

It is therefore a realistic option for companies to review the ingredients of their products and, if a given product contains meat or dairy, to consider whether that ingredient is really necessary in the product and, if so, whether it can be replaced with a plant-based alternative.

¹⁰⁰ <https://trademagazin.hu/en/a-lidl-a-veganuar-2025-kiemelt-elelmiszerlanc-partnere-lett/> (retrieved: 7 July 2025)

¹⁰¹ <https://www.nestle.hu/hagyd-el-a-hust-januarban> (in Hungarian only, retrieved: 7 July 2025)

¹⁰² <https://www.dm.hu/dm-inspiraciok/temak-vilaga-a-dm-nel/vegan-januar> (in Hungarian only, retrieved: 7 July 2025)

¹⁰³ <https://trademagazin.hu/en/vegan-vagy-hagyomanyos-a-lidl-mindkettot-azonos-aron-kinalja/> (retrieved: 7 July 2025)

¹⁰⁴ https://gvh.hu/pfile/file?path=/dontesek/agazati_vizsgalatok_piacelemzesek/agazati_vizsgalatok/jelentes-tervezet-a-tej-es-tejtermek-magyarorszag-piacan-lefolytatott-gyorsitott-agazati-vizsgalatrol&inline=true (in Hungarian only, retrieved: 7 July 2025)

¹⁰⁵ <https://telex.hu/gazdasag/2025/03/20/megneztuk-melyik-boltban-mennyivel-lettek-olcsobbak-az-arrestoppos-termeket> (in Hungarian only, retrieved: 7 July 2025)

¹⁰⁶ <https://trademagazin.hu/en/vaj-es-margarinmarkak-az-ero-veluk-van/> (retrieved: 7 July 2025)

Although it is possible that in the case of a single product, this does not affect a large amount of raw materials, however, their total annual consumption can add up to a substantial volume (especially in the case of a larger company) which is worth addressing on the one hand, and on the other hand, can substantially reduce the greenhouse gas emissions caused by the company.

4.2.4 Review of suggestions and recipes related to product preparation from a sustainability perspective

While in the previous subchapter, we showed that companies can reduce their environmental footprint by choosing the right ingredients for their products, this is also true for the preparation recommendations and recipes they display for products that require home preparation and additional ingredients. Research shows that the alternatives offered and how they are presented, including default options, influence consumers' product choices (Cravener et al., 2015; Zhang et al., 2024).

In many cases, these proposals and recipes include milk, dairy products or meat. Even partial replacement of these ingredients could be beneficial from a sustainability point of view. This can be achieved in two ways:

- Suggesting the use of alternative ingredients: in this case, the method of preparation would not change, only the ingredients used, for example, milk could be replaced with a plant-based drink, butter with margarine or olive oil, and meat with a plant-based meat alternatives or tofu. There are various ways of implementing this:
 - Indication of the possibility of using a product of animal and plant origin at the same time (e.g. milk or oat drink).
 - Indication of the possibility of using the animal- and plant-based products at the same time but highlighting the plant-based alternative with additional labelling (e.g. “our proposal”) or a targeted sustainability message (e.g. “the climate-friendly choice”).
 - Indication of the use of plant-based products only.
- Coming up with alternative use suggestions or recipes: although it requires substantially more effort, companies can also think about whether meat or milk is absolutely necessary for the use and preparation of their products, and they can come up with completely new preparation methods and recipes. For example, Bolognese sauce can be made with red lentils,¹⁰⁷ and the meaty pancakes from Hortobágy can be made entirely from plant-based ingredients.¹⁰⁸ These preparation methods could also be indicated on the product packaging or website. In this case, the three alternative implementation methods presented in the previous point are also possible:
 - Simultaneous display of the “traditional” and more sustainable way of preparation and use.
 - Highlighting the more sustainable way of preparing and using it with additional labelling (e.g. “our proposal”, “healthier choice”) or a targeted sustainability message (e.g. “the climate-friendly choice”), or possibly with a call for users to try something new.
 - Displaying only the alternative preparation and consumption method.

¹⁰⁷ <https://streetkitchen.hu/receptek/vega-bolognai-voroslencsebol> (in Hungarian only, retrieved: 9 September 2025)

¹⁰⁸ <https://streetkitchen.hu/receptek/hortobagyi-vegan-palacsinta> (in Hungarian only, retrieved: 9 September 2025)

These changes are also beneficial because even if only a small proportion of consumers change their habits as a result, dairy and meat alternatives and dairy- and meat-free foods will become more widely known, more consumers will encounter them, which may increase their acceptance and reduce resistance to these products.

4.2.5 Labelling on packaging

In Subchapter 4.1.5, we have already shown that a uniform sustainability labelling system is feasible and can have a positive impact on consumer behaviour. While such a system works best if it covers all products, a company or retailer can unilaterally introduce such a system, similar to the Nutri-Score nutrition label, which can be seen on the products of several international food companies, and which some retailers require to be displayed on their private label products.

The approach mentioned earlier is recommended for implementation, i.e. the use of generic data when own measurements are not available. If a retailer is implementing a labelling system for its private label products, the use of generic data can be a great help for manufacturers. However, in order to compare the results, it is necessary for the retailer to designate the methodology to be applied on the one hand and the source of the generic data on the other. This will ensure that labels on two different products are definitely comparable.

4.2.6 Rethinking sustainability communication

Many food companies carry out some kind of sustainability activity, which they also communicate through various channels. Although according to the advertising research conducted as part of the GVH's market analysis of green claims¹⁰⁹ found only 3.1% of domestic advertisements contained some kind of sustainability content between 2019 and 2023, companies published many more sustainability-related claims on their product packaging and websites.

In the case of sustainability communication, it is an important expectation – as also formulated by the GVH – that it should be about corporate activities that have a substantial environmental impact. It would be beneficial if companies whose operations generate substantial methane emissions (in the context of this study, meat and dairy companies) paid particular attention to this area in their sustainability efforts and presented their efforts and results in reducing methane emissions in their communications.

According to a recent study,¹¹⁰ Danone is the only large European dairy company with methane emission targets and a related action plan, partly related to the company's B Corp certificate. The more companies take up this topic, the stronger the impact it will have on consumers and, through this, on other companies. Therefore, it is essential for a meat or dairy company that prioritises sustainability to make progress in this area and to incorporate it into its corporate communications.

¹⁰⁹ https://gvh.hu/pfile/file?path=/dontesek/agazati_vizsgalatok_piacelemzesek/piacelemzesek/Kantar_Media_Fenntarthatosagi_uzenetek_megjelenese_a_reklamokban_240110.pdf&inline=true (in Hungarian only, retrieved: 10 June 2025)

¹¹⁰ <https://changingmarkets.org/report/running-latte/> (retrieved: 10 June 2025)

4.3 TRANSFORMING THE SOCIAL PERCEPTION OF MEAT AND DAIRY PRODUCTION

Finally, we would like to highlight an issue underlying positive social attitudes towards meat and dairy production and consumption, which can only be changed in the long term, but needs to be addressed as soon as possible.

Agriculture currently employs only 4.2% of employees in Hungary,¹¹¹ so the vast majority of the population has no direct connection to it. This is especially true for livestock farming; most people encounter meat and dairy products only on store shelves, neatly packaged and displayed. Thus, they have no first-hand experience of how an agricultural farm or a slaughterhouse operates. Most people also have an idyllic view of industrial livestock farms, where animals live happily together, feel good and have everything they need. Peter Singer (2015) provides a vivid example of this:

“Very few farms were ever as idyllic as that traditional image would have us believe. Yet we still think of a farm as a pleasant place, far removed from our own industrial, profit-conscious city life. Of those few who think about the lives of animals on farms, not many know much about modern methods of animal raising. Some people wonder whether animals are slaughtered painlessly, and anyone who has followed a truckload of cattle on the road will probably know that farm animals are transported in extremely crowded conditions; but not many suspect that transportation and slaughter are anything more than the brief and inevitable conclusion of a life of ease and contentment, a life that contains the natural pleasures of animal existence without the hardships that wild animals must endure in their struggle for survival” (p. 154).

These idyllic images are partly fuelled by childhood experiences, where a large part of the storybooks and fairy tales take place on farms, where the animals are happy, live well, everything is nice and good, and of course, there are only a few animals. George Monbiot in *The Guardian*¹¹² put it this way:

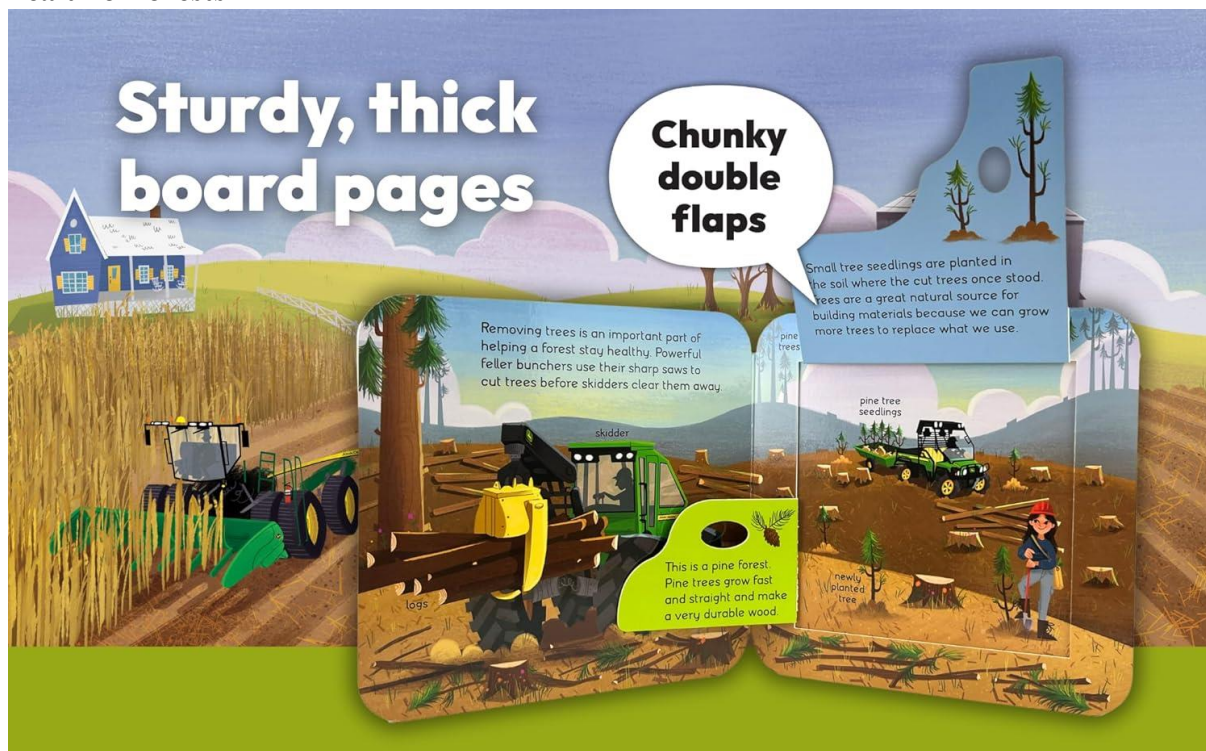
“A remarkable number of books for pre-literate children are about livestock farms. The farms they imagine look nothing like the industries that produce the meat, dairy and eggs we eat, which are generally places of horror. The stories they tell are a version of an ancient idyll of herders with their animals, built across thousands of years in pastoral poetry and religious traditions. Livestock farming in this idyll is a place of safety, harmony and comfort, into which we subconsciously burrow at times of unease.”

In addition, some storybooks convey messages that are quite shocking (Figure 12), but young children, lacking a critical sense, obviously accept them, which may influence their long-term views on sustainability and nutrition.

¹¹¹ 2024 HCSO data (https://www.ksh.hu/stadat_files/mun/en/mun0009.html, retrieved: 11 June 2025)

¹¹² <https://www.theguardian.com/commentisfree/2023/may/26/farming-good-factory-bad-global-food-crisis> (retrieved: 11 June 2025)

Figure 12. A storybook that cheerfully interprets deforestation as a way of preserving the health of forests



Source: REDWING, J.–TAYLOR, J. (2020): *Peek-a-Flap Dirt*. Rolling Meadows, Cottage Door Press.

This may also be the reason why free-range and regenerative agriculture are attractive keywords today, even if they do not offer a real solution, unless meat and dairy consumption were to decrease substantially.¹¹³

The meat and dairy industry lobby also plays on this idyllic image when it constantly talks about free-range farming and the role of animal husbandry in soil regeneration,¹¹⁴ which is only true for a minimal part of production. On the packaging and advertising of many meat and dairy products, happy and free-grazing animals appear,¹¹⁵ also playing on this image, which could not be further from the reality of industrial livestock farming. This is particularly problematic because, according to academic research, in both Germany and the Netherlands, awareness of the negative aspects of industrial agriculture (environmental damage, consumption of antibiotics, suffering and fear) is the most motivating for people to reduce meat consumption (Verain et al., 2024), but instead of knowing reality, many people still have false, idyllic images.

And if someone tries to cast a shadow on this idyllic image, they try to silence them,¹¹⁶ because most people do not like to see a reality that so sharply contradicts their ideas and the dream world they live in.

¹¹³ <https://www.theguardian.com/commentisfree/2025/may/07/cattle-sheep-farming-sustainable-food> (retrieved: 11 June 2025)

¹¹⁴ For example: https://copa-cogeca.eu/natural_resources (retrieved: 11 June 2025).

¹¹⁵ A very extreme example of this is MasterGood's advertisement launched in 2024: <https://media1.hu/2024/05/29/allatvedok-reklamtorveny-modositasa-mastergood-erkolcstelen-csirkegyalazo-reklam/> (in Hungarian only, retrieved: 11 June 2025).

¹¹⁶ Even in the European Parliament: <https://www.politico.eu/article/european-parliament-flinches-at-factory-farming-reality/> (retrieved: 11 June 2025).

In many cases, films and series aimed at older people also reinforce existing habits, depicting environmentalists, vegetarians and vegans as strange, unpleasant people. Just watch *Modern Family* Season 5, Episode 12.

That is why it is necessary to first eliminate these false claims and imagery, to remove them from children's books, so that the new generations growing up will no longer be exposed to this false reality. This does not mean, of course, that we should show slaughterhouse footage to preschoolers, but it does mean that we should not make them believe in a kind and idyllic farm life; children's books should be about other topics (just as many children's books are not about farms even now).

Secondly, in films and series, it would also be necessary for environmentalists and those who follow a vegetarian and vegan lifestyle to be portrayed as positive characters, for the characters to go to vegan restaurants, so that this kind of lifestyle appears good, attractive and worth following. Cooking shows should also have a vegan dish, or maybe a vegan day. In many cases, it is enough if it is revealed as incidental information in a scene related to a meal that a long-time likeable character or protagonist does not eat meat or milk, or is observing a meat-free day, or has joined the Veganuary challenge and enjoys it. The patterns and images seen in films and series can have a strong influence on people, and if they see this kind of lifestyle and mentality in many places, it will have an impact on them. This is precisely the goal: to increase social acceptance and openness.

Thirdly, the reality of industrial agriculture can also be portrayed in films, series and songs. Often, it is enough if something about this appears briefly in a conversation or image. Of course, it is even better if there are films and series that present this in a way that is understandable to the general public. A good example of the latter is Netflix's mini-series 'You Are What You Eat: A Twin Experiment'.¹¹⁷

¹¹⁷ <https://www.netflix.com/hu-en/title/81133260> (retrieved: 12 July 2025)

5 KEY POINTS, THREATS AND AREAS OF ATTACK

The implementation of the government and corporate interventions presented and recommended in Chapter 4 may be hampered by certain social conventions, opposed by certain interest and lobby groups, and may also entail political risks. We will discuss these in more detail in this chapter.

5.1 BELIEFS, FEARS AND CONSPIRACY THEORIES IN SOCIETY

Concerns about climate change are high in Hungarian society, which is also supported by a Eurobarometer survey conducted in the spring of 2025,¹¹⁸ according to which 92% of domestic consumers consider climate change to be a very serious or fairly serious problem. In the survey, 62% of Hungarian consumers said they had taken some actions in the fight against climate change, which is slightly above the EU average (59%). At the same time, only 15% of Hungarians bought or consumed less meat for this purpose, while the EU average was 25%. Thus, the reduction of meat (and dairy) consumption is much less widespread in Hungary than in other EU Member States. Domestic research also confirms that price and taste are the most important factors for consumers in Hungary, and sustainability plays a minor role in product choice decisions.¹¹⁹

The biggest problem in this area is not only the lack of active actions, but also the fact that many people fundamentally question the necessity of this step, and associate unfounded health risks with plant-based alternatives, while they consider animal-based products to be absolutely healthy. Reality, however, is much more sophisticated, and in general, the opposite is true. We present two vivid examples of this problem:

- In the first half of 2024, Upfield (now Flora Food Group) launched its “Skip the Cow” commercial, which was the domestic version of the international campaign, which won the Bronze Lion Award at the world’s most prestigious advertising festival, the Cannes Lion International Festival of Creativity in 2024.¹²⁰ The purpose of the advertisement was to increase awareness and consumption of the Rama butter alternative. The comments under the advertisement’s Facebook post¹²¹ clearly show the resistance that stands in the way of positive changes. A large number of commenters consider butter to be much healthier than margarine, with several writing that the Rama butter alternative is made from palm oil and hydrogenated, neither of which is true.
- On 3 May 2025, Gergely Karácsony, the Mayor of Budapest, published a post on Facebook¹²² about the reform of public catering in the city. One of the key elements of this plan was to reduce the number of meat-based dishes served and increase the consumption of fruits and vegetables. In the uploaded video, Gergely Karácsony tasted a meat-based bolognese and a pea protein-based bolognese and was unable to tell which was made with real meat and which with a plant-based meat alternative.

¹¹⁸ <https://europa.eu/eurobarometer/surveys/detail/3472> (retrieved: 16 July 2025)

¹¹⁹ https://hvg.hu/gazdasag/20220922_rama_felmeres_elelmiszerek_vasarlasi_ar_iz_egeszseges (in Hungarian only, retrieved: 10 June 2025)

¹²⁰ <https://www.florafoodgroup.com/stories/press-and-media/skip-the-cow-wins-cannes-lions-bronze> (retrieved: 10 June 2025)

¹²¹ <https://www.facebook.com/RamaMagyarország/posts/922926639835350> (retrieved: 10 June 2025)

¹²² <https://www.facebook.com/karacsonygergely/videos/669046985881719> (retrieved: 10 June 2025)

Despite similar measures being introduced in several other European countries,¹²³ the video received numerous comments that misinterpreted the announcement, interpreting it as a complete ban on meat in public catering in Budapest rather than a reduction in meat consumption. Others questioned the necessity of reducing meat consumption and lamented its harmful health effects, envisioning that this would hinder children's development, while no one mentioned the important problem of childhood obesity in Hungary and that excessive consumption of meat and dairy products is partly to blame for this.

Also related to this topic is the fact that, due to the reappearance of foot-and-mouth disease in Hungary in early 2025, a conspiracy theory has become increasingly widespread regarding the animals (cattle and pigs) that were slaughtered, claiming that the epidemic was artificially created with the aim of eliminating domestic livestock farming, thus paving the way for laboratory (or cell-cultured) meat.¹²⁴ This also shows that for a large part of society, reducing meat consumption is a taboo subject, and professionals and politicians who advocate this are lobbyists whose goal is to destroy society. This makes the public policy interventions indicated in the study politically difficult to implement, especially those that could have a greater impact on prices (such as agricultural subsidies and the restructuring of the VAT system).

Garcia et al. (2019) show that almost immediately after the publication of the EAT–Lancet report, misinformation and conspiracy theories appeared, which, based on Twitter data, spread more and more, and a few weeks after the publication of the report, they became predominant and were able to address ambivalent people and increase their scepticism towards the EAT–Lancet report. Recent research shows in detail that this counterattack was organised and instigated by the meat industry, rather than being a grassroots movement.¹²⁵ One must be prepared for these highly damaging but well-organised defences in all similar communications. Table 3 and Chapter 0 provide guidance on how to deal with them.

5.2 THE PROBLEM OF ULTRA-PROCESSED FOODS

In his book 'Eating Animals', Jonathan Safran Foer (2018) explores in detail the role of animal-based foods in diet and culture. He shows that reducing or even completely eliminating the consumption of meat and dairy products causes dietary changes that can have a substantial impact on culture and human relationships, for example, as the national dishes of many countries are meat and dairy-based. This is why plant-based alternatives to meat and dairy products are of paramount importance, as they allow us to continue using the familiar ingredients, flavours and textures, but on a plant-based basis, so that old recipes, favourite dishes, habits and traditions can be preserved, while at the same time reducing greenhouse gas emissions. These products can also help consumers to dare to make changes, as the first steps do not require too much change. A dish can be prepared in essentially the same way using a plant-based cream alternative instead of cream, making the switch easier and potentially leading to more substantial changes later on.

¹²³ <https://prove.hu/iskolai-menza-vegan-opcio-spanyolorszag/> (in Hungarian only, retrieved: 10 June 2025)

¹²⁴ <https://qubit.hu/2025/03/30/itt-az-igazsag-ezert-olik-le-az-allatainkat> (in Hungarian only, retrieved: 10 June 2025)

¹²⁵ <https://changingmarkets.org/report/meat-vs-eat-lancet-the-dynamics-of-an-industry-orchestrated-online-backlash/> (retrieved: 29 September 2025)

Carr et al. (2025) examined how food consumption changed among British households that were able to significantly reduce their greenhouse gas emissions related to their diet. Based on their results, the consumption of dairy and meat alternatives has also increased among them, especially dairy alternatives. This has increased even among those who otherwise replaced meat primarily with dairy products. These products therefore play an important role in the transition to a more sustainable diet. It is no coincidence that the meat and dairy industry lobby is strongly attacking these foods on several fronts.

Some of the attacks point to a higher degree of processing of meat and dairy alternatives.¹²⁶ The adverse health effects of ultra-processed foods (UPFs) have already been shown in several studies (Liang et al., 2025), but the picture is much more complex, as the group of ultra-processed foods is not homogeneous at all. Research that breaks down ultra-processed foods into subgroups shows that not all highly processed foods are equally harmful, and there are even some that reduce the risk of developing type 2 diabetes, for example. These include ultra-processed cereals, fruit-based products and plant-based alternatives, while the most harmful highly processed products are animal-based products and ready-to-eat/heat mixed meals, which in most cases also contain animal-based ingredients (Chen et al., 2023; Dicken et al., 2024). So, while plant-based alternatives do not worsen the risk of developing type 2 diabetes, but even reduce it, the health effects of ultra-processed meats and dairy products are the worst. This is not surprising, as the harmful health effects of processed meat are clear from GBD research (GBD 2021 Risk Factors Collaborators, 2024), and they are also considered carcinogenic by the World Health Organization.¹²⁷

Although plant-based meat and dairy alternatives are a relatively new product category, and their exact health effects have not yet been fully explored, it cannot be concluded from the fact that processed meat and dairy products have harmful health effects that these products are also harmful. It cannot be said that processed meat products with proven harmful health effects should not be replaced with processed plant-based products.

It is also worth mentioning that vegetarian and vegan consumers consume roughly the same amount of ultra-processed foods as meat eaters (Chang et al., 2024). Therefore, empirical data do not show that people who change their lifestyle and eliminate meat and dairy products from their diet typically replace them with ultra-processed products. It is more likely that they consume processed plant-based products instead of processed meat and dairy products, which, based on available scientific findings, is more beneficial than harmful from a health perspective. This is confirmed by the research of Daas et al. (2024):

“UPF consumption was considerably lower and higher for participants consuming more healthy and unhealthy plant-based foods, respectively. Despite this, the amount of plant-based foods in the diet seemed to explain more of the observed differences in all-cause mortality risk and environmental impacts than UPF consumption. [...] Thus, based on our study population, replacing animal products with healthy plant-based foods in the diet could improve human health and reduce most aspects of environmental impact (e.g. GHGE [greenhouse gas emissions]) irrespective of UPF consumption” (p. 2970).

Ultra-processed plant-based meat and dairy alternatives are therefore not to be feared; based on the available scientific evidence, their moderate consumption is not harmful to health

¹²⁶ <https://meatthefacts.eu/home/activity/campaign-updates/what-is-the-difference-between-processed-and-hyper-processed-food/> (retrieved: 26 October 2025)

¹²⁷ <https://nutritionsource.hsph.harvard.edu/2015/11/03/report-says-eating-processed-meat-is-carcinogenic-understanding-the-findings/> (retrieved: 15 July 2025)

and, if they replace processed meat products, they may even be beneficial. However, this message needs to be communicated clearly to as large a proportion of the population as possible. This may require well-planned communication campaigns, possibly including references on product packaging.

5.3 POLITICAL CONSIDERATIONS

Vadovics et al. (2024) examined what steps are needed to achieve a 1.5°C lifestyle and what their social acceptance is. Switching to a vegetarian or vegan diet was among the least preferred options based on the results. Overall, the results of the study showed that people are the least willing to change their daily lifestyle and behaviour, and people are most open to the benefits that can be achieved with smaller changes (e.g. using more energy-efficient lighting and household appliances, insulation of the house). The Dutch experience also shows that public policies aimed at reducing nitrogen emissions from agriculture have provoked substantial resistance among farmers, which has also led to substantial policy changes in the Netherlands (Siegmann, 2024), although slow and often contradictory communication and the differing approaches of certain parties in the governing coalition also played a substantial role in this.¹²⁸

Cutting back on meat and dairy consumption may therefore meet with substantial resistance, which may also be reflected in the election performance of the political party that undertakes it. Especially in areas with lower purchasing power, the implementation of measures involving price increases can be risky, even if the prices of vegetables, fruits and legumes fall at the same time.

A solution could be to carry out extensive consultations with all stakeholders before the measures are introduced, as was the case in Denmark (see Subchapters 0 and 6.2) or to provide direct financial compensation to households, i.e. if the additional state revenue generated by higher prices for meat and dairy products is returned to the people in the form of direct financial transfers (see Subchapters 6.3 and 6.4). The key point of this type of measure is that the additional revenue generated as a result of the tax increase or the amount saved as a result of the reduction of subsidies is distributed equally among the members of society. Due to the equal distribution, the majority of society benefits from the measure, while the wealthiest do not, but on the one hand, they are less numerous, and on the other hand, due to their higher income, the price increase is less problematic for them. An additional advantage of the measure is that it also reduces social inequalities.

5.4 ECONOMIC ASPECTS AND THE POWER OF THE AGRICULTURAL LOBBY

The level of subsidies for agriculture is so high in the EU and Hungary that it has become one of the most decisive factors in the profitability of agricultural producers.¹²⁹ Since the profits and survival of the agricultural actors do not depend on consumer decisions, but on subsidies, recognising their elementary interests, the agricultural actors have very well-organised lobbying activities both at home and at the EU level. Moreover, this is constantly evolving,

¹²⁸ <https://www.theguardian.com/environment/2023/nov/16/nitrogen-wars-the-dutch-farmers-revolt-that-turned-a-nation-upside-down> (retrieved: 30 July 2025)

¹²⁹ <https://masfelfok.hu/2023/12/20/sokkal-dragabb-hus-tej-sertes-marha-baromfi-zoldseg-gyumolcs-gazdasag-allami-tamogataskor-klimavaltozas/> (in Hungarian only, retrieved: 10 June 2025)

with lobby organisations learning effectively from various civil society and environmental organisations, for example, by organising flash mobs.¹³⁰

Several investigative articles have recently been published confirming that EU legislation is often written by agricultural and industrial lobby organisations,¹³¹ and that these organisations have actively contributed to, among other things, the derailment of the European Green Deal¹³² and the creation of movements and slogans against the EAT–Lancet dietary recommendation.¹³³

In addition, these organisations are constantly communicating with society, often using fake news dressed up as science, half-truths and poor-quality research to increase resistance to behavioural changes that are already difficult to implement.¹³⁴

As these organisations are driven by financial interests, they can only be curbed by appropriately designed financial incentives. These may include the restructuring programme described in Subchapter 4.1.9, which can make farmers financially interested in the success of the programs.

At the same time, the spread of alternative protein sources is a clearly visible trend at the international level. In addition to meat, plant-based and mushroom-based proteins, cell-cultured meat, and precision fermentation are also increasingly appearing at international exhibitions and fairs.¹³⁵ And this clearly indicates that there is major potential in these products, so the switch can be worthwhile and profitable at the producer level as well.

5.5 RURAL LIFE AND THE FUTURE OF FARMERS

One of the frequently voiced arguments against reducing meat and dairy consumption is that it is a natural part of rural life and that taking it away would mean the loss of the rural way of life.

Although traditional livestock farming can be part of traditional rural life, nowadays fewer and fewer people keep backyard animals, and a large part of meat consumption is served by industrial livestock farms. In this context, it is also important to see that the complete disappearance of meat and dairy consumption is an unrealistic idea. The interventions examined and proposed in the present study do not envision this either, but a decrease in large-scale production and the consumption of the products derived from it. So in fact, none of the proposals pose a threat to rural backyard animal husbandry at all, they can only bring about a decline in industrial livestock farming, which is welcome from a social, economic, sustainability and ethical point of views. We note that these livestock farms pollute the very rural environment they want to protect with their emissions of harmful substances (which also include various antibiotic residues released into the environment).

¹³⁰ <https://www.agriland.ie/farming-news/copa-cogeca-announces-flash-action-outside-european-parliament/> (retrieved: 10 June 2025)

¹³¹ <https://www.desmog.com/2023/10/04/revealed-meetings-blitz-between-big-ag-and-anti-green-lawmakers-in-europe/> (retrieved: 10 June 2025)

¹³² <https://www.politico.eu/article/copa-cogeca-farming-lobby-europe/> (retrieved: 10 June 2025)

¹³³ <https://www.theguardian.com/environment/2025/apr/11/pr-campaign-may-fuelled-food-study-backlash-leaked-document-eat-lancet> (retrieved: 10 June 2025)

¹³⁴ For example, <https://www.theguardian.com/commentisfree/2025/may/07/cattle-sheep-farming-sustainable-food> (retrieved: 10 June 2025) or <https://meatthefacts.eu/home/activity/campaign-updates/livestock-without-myths-science-reveals-the-truth-behind-the-sector/> (retrieved: 26 October 2025).

¹³⁵ <https://trademagazin.hu/en/iffa-2025-megmutatta-erejet-a-hus-es-feherjeipar-frankfurtban/> (retrieved: 11 June 2025)

It is also important to mention that livestock farming, slaughterhouses and meat processing plants typically offer poor-quality and underpaid jobs. The average gross income of those working in livestock farming has been between 80 and 85 per cent of the national average wage over the past six years,¹³⁶ i.e. substantially below the average. Furthermore, several international studies have shown that slaughterhouse workers have higher crime rates and more frequent violent and sexual crimes (e.g. Fitzgerald et al., 2009; Jacques, 2015). It is no coincidence that, according to the AKI's 2022 publication,¹³⁷ one of the biggest problems in the livestock farming sector at the national level is labour shortage.

It is difficult to understand how the forced maintenance of underpaid, poor-quality, violent jobs could be the key to preserving rural lifestyles.

¹³⁶ <https://statinfo.ksh.hu/Statinfo/QueryServlet?ha=LG2001TT> (retrieved: 9 September 2025)

¹³⁷ <https://www.aki.gov.hu/termek/az-agrarszakkepzes-szerepe-a-munkaero-utanpotlasban-2022/> (in Hungarian only, retrieved: 11 June 2025)

6 INTERNATIONAL EXAMPLES AND INITIATIVES TO FOLLOW

Finally, in the last chapter of the study, we briefly present some successful examples and initiatives that can serve as models for how to successfully introduce and implement sustainability-oriented measures and projects in a way that also ensures adequate social support. The examples include public policy measures and corporate initiatives.

6.1 CARBON TAX ON AGRICULTURAL PRODUCERS IN DENMARK

Denmark is the first country in the world to recognise that achieving climate neutrality goals is impossible without transforming agriculture, so it will extend the scope of the carbon tax to farms from 2030.¹³⁸ From 2030, farmers will have to pay an effective tax of DKK 120 (approx. HUF 6,400) on every tonne of CO₂-equivalent greenhouse gases emitted (including methane), which will increase to DKK 300 (approx. HUF 16,000) from 2035 (Blandford, 2024).

The carbon tax imposed on agriculture, and especially on livestock farming, is also interesting because Denmark is a very substantial meat and dairy producing country, a net exporter of these products. Denmark accounts for 7% of the EU's pork production and 4% of its milk production, while its population is only 1.3% of the EU's population,¹³⁹ so agriculture and livestock farming are of paramount importance to Denmark. However, this also means that emissions from these sectors, particularly from the meat and dairy industries, are substantial, with agriculture being the second largest emitter in the country after energy production (Turna, 2025).

Before imposing the tax, the government held consultations with industrial, agricultural and environmental organisations and interest groups, and the final proposal was supported by all industry organisations, even farmers. This is because the revenues from the tax will be used to support farmers' emission reduction efforts and adaptation to climate change in a targeted manner, so that the revenues will be fully returned to the sector, at least in the first year (Blandford, 2024; Turna, 2025). In addition, the basis and possibility for introducing the tax were created by the fact that Danish farmers are already required to provide detailed data on their activities, which can be used to determine the tax for individual farms in an administratively manageable manner (Sørensen et al., 2025).

According to the modelling of Sørensen et al. (2025), a large part of the tax is passed on to the purchasers of the products and ultimately to the consumers. As the possibilities for technological development are limited, the tax will facilitate the transition from livestock farming to crop production and from conventional to organic production, while reducing meat and dairy production.

6.2 PLANT-BASED FOOD ACTION PLAN IN DENMARK

Denmark is not only at the forefront of introducing an agricultural carbon tax in Europe (and the world), but also wants to base its entire food system much more on a plant-based basis, despite the fact that it is one of the largest European meat- and dairy-producing countries at the

¹³⁸ <https://www.agrarszektor.hu/allat/20240625/ilyen-meg-nem-volt-co-adot-vetnek-ki-a-gazdakra-49366> (in Hungarian only, retrieved: 12 July 2025)

¹³⁹ <https://ec.europa.eu/eurostat/databrowser/bookmark/df00aab7-2b1c-4fda-a7f9-4b5ab571d778?lang=en> (retrieved: 16 July 2025)

moment and is also a major meat-consuming nation. Meat consumption per capita is slightly above the Hungarian value, 90 kg/capita per year.¹⁴⁰

However, in order to reduce greenhouse gas emissions, the Danish government adopted a detailed and science-based action plan to develop plant-based food systems in the autumn of 2023, which was unanimously supported by the parliament. Several universities and nearly 30 agricultural organizations participated in the compilation of the action plan, and a public written consultation was also carried out.

The plan focuses on the entire supply chain, from production and R&D to the end consumer, including catering, canteens and exports. The main elements of the plan are as follows:¹⁴¹

- A financial fund will be set up for the development of plant-based value chains, for which DKK 675 million (approximately HUF 36 billion) will be allocated for the period 2023–2030.
- Support start-up companies operating in the field with incubator programmes.
- Special support will be given to the emergence and development of new technologies, such as precision fermentation and biotechnology, and the development of foods made from algae and seaweed.
- Review consumer behaviour and preferences and support relevant nutritional research, especially with regard to the elderly and the sick.
- In agriculture, they encourage crop diversification and conversion to organic production over as large an area as possible, for which substantial resources are allocated from the Danish CAP plan.
- Support industrial developments to develop the healthiest and tastiest plant-based foods possible.
- Production and processing are subsidised from the CAP budget with DKK 845 million (approximately HUF 45 billion).
- The goal was to improve export capacity through appropriate branding and improved access to foreign markets. To this end, public-private partnerships (PPPs) are being established with the involvement of Danish embassies.
- Topics related to plant-based foods will also be included in education, including chef training. In addition, special training courses are organised for chefs in public catering.
- The possibility of including plant-based drinks in the School Milk Scheme is being explored.

It can be seen that the action plan takes a complex approach, covering all relevant areas, and that substantial financial resources have been allocated to each area. Education and awareness-raising are also key components of the action plan, which could stabilise and increase consumer acceptance of, and willingness to purchase, plant-based foods and diets.

The creation of the action plan and its high political support are due to the fact that everyone found something appealing in it: the market for plant-based foods is growing, and breaking into and succeeding in this market offers good business opportunities in addition to sustainability, health, and ethical benefits. While other countries, such as the Netherlands,

¹⁴⁰ https://ourworldindata.org/grapher/per-capita-meat-type?time=latest&country=CHN~USA~IND~ARG~PRT~ETH~JPN~BRA~OWID_WRL~ESP~DEU~DNK~HUN (retrieved: 12 July 2025)

¹⁴¹ <https://en.fvm.dk/news-and-contact/focus-on/action-plan-on-plant-based-foods> (retrieved: 12 July 2025)

wanted to achieve emission reductions through livestock reductions, which is a less attractive narrative and thus led to political debates, divisions and polarisation, the Danish action plan presented an attractive alternative in which everyone could find business opportunities.¹⁴²

6.3 ELIMINATION OF SUBSIDIES WITH SIMULTANEOUS COMPENSATION OF CONSUMERS

Subsidies for environmentally harmful products, especially fossil fuels, are a problem in many developing countries. On the one hand, subsidies put a substantial burden on the budget; on the other hand, their distribution is socially very unfair (since wealthier people consume significantly more of these products than poorer people), and thirdly, they are environmentally harmful. Nevertheless, phasing them out is not a trivial matter, as the abolition of price subsidies would lead to immediate price increases, which would cause social discontent.

In Iran, for example, fuel was very cheap before 2010 thanks to state subsidies. In 2010, the government abolished these subsidies overnight, which caused fuel prices to quadruple. Despite this, citizens almost unanimously supported the measure, which was due to the compensation mechanism. 30% of the saved subsidies were given to companies to implement energy-saving investments, 20% to public institutions to offset their rising costs, while the remaining 50% was distributed among the population. All citizens received a lump sum compensation of USD 40 per month, except for the richest 20% of society, so social inequalities and poverty in the country have also been substantially reduced. There are similar examples from Indonesia and Ghana.¹⁴³

The key to success is thorough preparation, widespread information and adequate compensation. These were also applied by a Hungarian public policy intervention in 1976, which also reduced subsidies on meat products. After nearly a decade of no increase in the price of meat, it was completely detached from production costs, and by 1976, the difference had become untenable. Therefore, the Council of Ministers decided to increase the prices of meat products by an average of 30%, while essentially every citizen (from infants to pensioners) received a net monthly compensation of HUF 60.¹⁴⁴ (At the time, this amounted to 1.9% of the average gross income, but for the poor it was a much higher percentage.¹⁴⁵) Based on the HCSO's long-term inflation time series,¹⁴⁶ this amounted to approximately HUF 4,300 per month in today's value, which is still 53% of the average amount spent on meat today (HUF 98,059 per capita per year in 2020¹⁴⁷), and in 1976 it was probably even higher. Thus, for the average consumer, the compensation was at least 20 percentage points more than the rate of price increase, which helped support for the reform.

6.4 INTRODUCTION OF A CARBON TAX IN AUSTRIA

The Austrian government introduced a carbon tax in the energy sector from 1 July 2022, which essentially covers the heating of buildings and transport. These two areas are responsible for

¹⁴² <https://www.forbes.com/sites/danieladelorenzo/2023/11/23/how-denmark-made-the-plant-based-action-plan-possible/> (retrieved: 15 July 2025)

¹⁴³ <https://theecologist.org/2023/mar/27/abolish-fossil-fuel-tax-breaks> (retrieved: 8 July 2025)

¹⁴⁴ https://www.levego.hu/sites/default/files/Meat_price_reform_Hungary.pdf (retrieved: 8 July 2025)

¹⁴⁵ https://www.ksh.hu/docs/hun/xstadat/xstadat_hosszu/h_qli001.html (in Hungarian only, retrieved: 16 July 2025)

¹⁴⁶ https://www.ksh.hu/stadat_files/ara/en/ara0002.html (retrieved: 8 July 2025)

¹⁴⁷ <https://stainfo.ksh.hu/Stainfo/QueryServlet?ha=OB1003R> (retrieved: 8 July 2025)

almost 40% of Austria's carbon dioxide emissions. The aim of the tax was to make companies not covered by the EU Emissions Trading System (ETS) pay tax on their carbon dioxide emissions. The tax rate increased from the initial EUR 30 (approx. HUF 12,000) per tonne to EUR 55 (approx. HUF 22,000) by 2025, which was also reflected in consumer prices. According to the plans, from 2026, an emissions trading system will be launched instead of fixed prices, and from then on, the system will no longer formally function as a tax.

The revenue from the tax will be redistributed to citizens, partly in the form of tax reductions and partly in the form of a direct cash benefit (climate bonus), the amount of which will depend on the quality of public transport in the region. In places with better public transport, the compensation will be lower, thus encouraging the use of public transport. In addition, energy-consuming sectors, including agriculture, receive a fixed amount of compensation, partly to avoid imported products that do not pay a similar carbon tax becoming relatively cheaper, thereby causing these sectors to decline.¹⁴⁸ Switzerland introduced a similar carbon tax in 2008.¹⁴⁹

6.5 BAN ON ADVERTISING MEAT PRODUCTS IN CERTAIN DUTCH MUNICIPALITIES

Harleem was the first city in the world where the local government banned the advertising of meat from industrial livestock farms from the beginning of 2024.¹⁵⁰ The ban has since been adopted by several other Dutch cities,¹⁵¹ with the aim of reducing the increase in consumption and demand caused by advertising, thereby making it easier to curb the consumption of meat products.

6.6 RETAIL INITIATIVES TO PROMOTE PLANT-BASED FOODS

The retail sector in Western Europe, especially in Germany, has been at the forefront of several forward-looking sustainability initiatives that have succeeded in reducing the consumption of meat and dairy products in favour of plant-based products. Five of these are presented here as examples.

1. Lidl adjusted the prices of its private label plant-based alternatives to the prices of meat and dairy products in October 2023 in Germany. Based on the experience of the first six months, sales of plant-based products increased by 30% as a result.¹⁵²
2. Lidl has also taken the initiative to place plant-based alternatives on shelves alongside their animal-based counterparts, making it easier to switch and encouraging consumers to choose more sustainable alternatives. Based on the results of the test period in the Netherlands, sales of plant-based products increased by 7% simply due to increased visibility within the store.¹⁵³
3. In 2020, the German Rewe Group displayed the true prices of the products, including external costs, in addition to the "normal" prices in one of its Penny stores, following

¹⁴⁸ <https://kluwertaxblog.com/2022/02/03/austrias-ecological-tax-reform-a-model-for-other-eu-member-states/> (retrieved: 12 July 2025)

¹⁴⁹ <https://theecologist.org/2023/mar/27/abolish-fossil-fuel-tax-breaks> (retrieved: 16 July 2025)

¹⁵⁰ <https://www.smithsonianmag.com/smart-news/a-dutch-city-is-banning-some-meat-advertisements-in-public-spaces-180980724/> (retrieved: 7 July 2025)

¹⁵¹ <https://www.nomeatmay.org/blog/dutch-banning-meat-ads> (retrieved: 7 July 2025)

¹⁵² <https://plantbasednews.org/news/lidl-increase-plant-based-food-sales/> (retrieved: 7 July 2025)

¹⁵³ <https://www.greenqueen.com.hk/lidl-netherlands-plant-based-meat-free-alternatives-sales-aisle/> (retrieved: 7 July 2025)

the TCA methodology (for more details, see Subchapter 2.1).¹⁵⁴ Following this positive experience, at the end of July 2023, consumers had to pay the actual prices, including environmental externalities, for nine private label products¹⁵⁵ in all 2,150 Penny stores in Germany for one week. The price increase was very substantial, between 30% and 100% for animal-based products, but only 5% for plant-based fried cutlets. The campaign, implemented in cooperation with the Technical High School Nuremberg and the University of Greifswald, served the purpose of raising awareness, and the price difference was used by the retail chain for climate protection purposes. The campaign proved to be successful, with a 50–70% drop in the sales of meat and dairy products affected by the campaign, while the sales of plant-based products increased. 53% of the respondents said that as a result of the promotion, they are now more aware of the true prices of different products.¹⁵⁶

4. The Rewe Group also opened a store in Berlin in 2024 that sells exclusively plant-based products, offering 2,700 vegan products (compared to “only” about 1,400 in an average Rewe store). The aim of the concept was to show the wide range of plant-based products already available and that they can completely replace animal-based products.¹⁵⁷
5. In addition, retail chains have an increasingly wide range of private label plant-based offerings, which they are constantly expanding.¹⁵⁸ In this context, Lidl has launched a start-up competition in Germany to develop new plant-based cheese alternatives. The winning product is planned to be marketed as Lidl’s plant-based private label product.¹⁵⁹ This shows that retailers are able to actively shape supply and stimulate product innovation, which holds promising opportunities for the future and could also transform consumers’ product choices.

6.7 INTRODUCTION OF VALUE-ADDED RECYCLED PRODUCTS IN THE ROHLIK.CZ ONLINE STORE

In October 2024, the Czech online grocery store Rohlik.cz launched an upcycled category, which exclusively offers products that are value-added foods made from industrial by-products and leftover food. As the raw materials for these products would otherwise have been discarded or used for some low-value purpose (e.g. composting), upcycled products can substantially reduce environmental impact by reducing food waste and promoting reuse.¹⁶⁰

In addition to the upcycled product category, the products also appear in their own product category, thereby increasing their potential reach. In the first half of the year, more

¹⁵⁴ <https://www.rewe-group.com/en/press-and-media/newsroom/press-releases/penny-labels-its-first-products-with-true-prices/> (retrieved: 16 July 2025)

¹⁵⁵ The products included in the test and their retail and “true” prices are available here: <https://geo.uni-greifswald.de/lehrstuehle/geographie/nachhaltigkeitswissenschaft-und-angewandte-geographie/projekt-wahre-preise-1> (in German only, retrieved: 7 July 2025).

¹⁵⁶ <https://tappcoalition.eu/nieuws/21535/german-supermarket-penny-true-price-week-successful-in-reducing-meat-dairy-sales> (retrieved: 7 July 2025)

¹⁵⁷ <https://privatbankar.hu/cikkek/vasarlo/kizarolag-vegan-termekek-et-forgalmazo-boltot-nyitott-berlinben-a-rewe-a-magyar-penny-nyavallalatga.html> (in Hungarian only, retrieved: 8 July 2025)

¹⁵⁸ <https://prove.hu/boviti-vegan-kinalatat-az-aldi-legalabb-ezer-uj-termek-bevezeteset-tervezi/> (in Hungarian only, retrieved: 8 July 2025)

¹⁵⁹ <https://vegconomist.com/cheese-alternatives/lidl-germany-proveg-incubator-launch-search-next-big-plant-based-cheese-innovation/> (retrieved: 8 July 2025)

¹⁶⁰ <https://forbes.hu/forbes-sztori/secondtaste-rohlik-kifli-upcycling/> (in Hungarian only, retrieved: 8 July 2025)

than 50,000 upcycled products were sold in the Czech online store, and the concept also won a prestigious international sustainability award.¹⁶¹ The success of the upcycled product category shows that with the right design, appearance and consumer communication, the sale and expansion of more sustainable products is possible.

¹⁶¹ <https://www.agroinform.hu/elelmiszeripar/hogyan-lett-vilagsiker-egy-magyar-elelmiszerprojekt-81261-001>
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