



clean air farming

Reducing Ammonia and Methane
Emissions from Agriculture

Air pollutants – Greenhouse gas emissions – Animal welfare

Economic instruments for eco- and climate-friendly and species-appropriate animal husbandry

Summary and policy implications

Introduction

As practised today, industrial food production is a major source of greenhouse gas and air pollutant emissions. Air pollution is associated with follow-up costs in the billions, especially in the health sector. While other sectors have already achieved major successes in reducing air pollutants and moderate successes in reducing greenhouse gases, reductions in agriculture have so far been minimal.

In order to achieve the clean air targets to which Germany has committed itself in various international agreements as well as in European and national laws, agriculture must also make its contribution. To not miss the targets of the National Clean Air Programme and thus the EU National Emission Ceilings Directive (NEC Directive), greater ambition is particularly needed in reducing ammonia from livestock farming. So far, technical solutions have only been able to absorb the emissions from the increased production. Therefore, ammonia emissions remain at a consistently high level.

The decision of the Federal Constitutional Court on the Climate Change Act has also clearly shown that “business as usual” is insufficient to achieve the climate goals. This also applies to the agricultural sector. Furthermore, the current IPCC AR6 report makes it clear that the concentration of methane in the atmosphere originating from animal husbandry is continuously increasing.

All this shows that a transformation towards a sustainable agricultural sector, especially in animal husbandry, is more than necessary. In this context, air pollution control, climate protection and animal welfare must all be considered together. The Competence Network for Farm Animal Husbandry (Borchert Commission), appointed by Agriculture Minister Julia Klöckner, proposes a levy for greater animal welfare of 40 euro cents per kilogramme of meat. From the point of view of the DUH, the approach should be implemented much earlier than proposed and should continue to be supplemented by environmental measures.

The barn of the future can and must ensure climate protection, clean air and animal welfare.

Transforming the sector involves land-based animal husbandry on farms with sustainable numbers of animals. Overall, it is essential to reduce the number of animals in relation to the area available on a farm. According to the National Assessment Framework for Animal Husbandry Procedures ([KTBL 2021](#)), barns must be converted in such a way that the requisite reduction in emissions harmful to the environment and health is ensured by making, above all, species-appropriate husbandry procedures with separate functional areas the norm. A regional reduction in the absolute number of animals in regions with a high animal density would also ease the pressure on the market for meat and milk, thus improving producer prices. Moreover, a meat levy must be used specifically to provide financial support to farms for conversion, as already called for by the Borchert Commission.

The Commission on the Future of Agriculture (SKEL), set up by Chancellor Merkel, complements the Borchert recommendations and points out the extremely high external costs of intensive livestock farming that currently predominates. The SKEL advocates a mix that can consist of economic instruments, such as a nitrogen surplus levy, as well as regulatory measures.

On behalf of Environmental Action Germany (Deutsche Umwelthilfe, DUH), Green Budget Germany (Forum Ökologisch-Soziale Marktwirtschaft, FÖS) has, therefore, investigated how different economic instruments can complement the Borchert approach, especially with regard to achieving climate and air pollution control targets. Within the framework of the study, various options for pricing on the production side were discussed. In addition, the use of funds for financing the necessary transformation processes towards a sustainable agricultural sector was outlined.

Summary of the study

➤ Forms of economic instruments in agricultural and food policy

The study first examined three forms of economic levy instruments in connection with the aforementioned objectives. If the main objective is to generate tax revenue, a linear levy per unit is suitable (this could be, for example, per livestock unit, per animal or per kilo or tonne of emission). This form of levy is the easiest to apply in bureaucratic terms, but it also generates the least steering effect, as it increases the production costs of all farmers to the same extent, regardless of the extent of environmental and climate impacts. Thus, while animal products become more expensive than plant products – which can stimulate more sustainable consumption patterns – a change in production is only stimulated to a limited extent.

A greater steering effect could be achieved by using a limit value below which no levy is charged. Farmers whose livestock numbers are in a healthy ratio to their agricultural area – so that they do not contribute disproportionately to environmental and climate burdens such as nitrate pollution, greenhouse gas or air pollutant emissions – will not be financially burdened. A maximum emission level, for example, can be used as a benchmark. If the limit value is exceeded due to an excessively high stocking density, a certain sum of money per tonne of emission is incurred.

The third option is to increase the levy progressively rather than linearly. A slight surplus would then only be subject to a small levy per unit, whereas a large surplus would be subject to a significantly higher levy per unit. This option results in the greatest steering effect, as a drastic disproportion between land area and livestock becomes uneconomic. Depending on what the specific objec-

tive is, the suitability of these options varies. Three potential levies with different objectives were developed in the study.

➤ Three potential economic instruments in comparison

1) The first option serves to **acquire funding for animal welfare measures** which, if properly designed, can have synergistic effects on air pollution control.

Here, the animal welfare levy of the Farm Animal Husbandry Competence Network is compared with a production-side levy. The basis for calculation is the investment requirement, which the Scientific Advisory Board of the German federal ministry of food and agriculture (Bundesministerium für Ernährung und Landwirtschaft, BMEL) puts at around €5 billion, and the annual ammonia emissions of 424,900 tonnes. As the primary objective is the acquisition of funding, the first option – the linear levy from the first animal onwards – is chosen. So as to be able to cover the financial needs for animal welfare measures, a levy of €11,767.47 per tonne of ammonia would have to be collected. This would mean a levy of €278.89 per beef unit, €54.13 per pig unit, and €3.29 per poultry unit. The average end consumer will incur additional monthly costs of €3.27 if consumption remains unchanged. If the levy were to be passed on exclusively to German consumers in order to be able to continue exporting cheaply, the additional costs would be €5.02 per person per month. For this levy to have a positive environmental impact, the payment of subsidies for animal welfare measures to farmers must be linked to environmental standards. As the animal welfare measures also aim to reduce the number of animals and the higher production costs lead to a slight decline in demand, in the long term, revenue from the levy would have to be expected to fall or the level of the levy would have to be constantly adjusted in order to continue to cover the €5 billion financial requirement.

2) The second option aims at **reducing the emission of air pollutants**.

The calculations show that, in 2030, a maximum of 1.05 cows, around 5.5 pigs or 89 chickens per hectare should be kept in order to meet the reduction obligation for ammonia emissions from the NEC Directive. This could also represent the threshold above which the levy becomes payable in the second option approach. To achieve a steering effect, the levy should then increase progressively to make livestock densities that are significantly above this threshold uneconomic. As this form of levy has the greatest impact on the agricultural sector, consideration should be given to initially introducing the levy at a low level and then gradually increasing it along a transparent price development path so as to give affected farms time to adapt and provide investment security. The revenues should be used to support the transformation process of this sector. A financial reward for environmental and climate protection measures is desirable. Furthermore, farmers should be supported in diversifying their income so that they may be prepared for the expected changes in the agricultural sector (e.g. effects of climate change, marketability of “lab-grown meat”).

3) The third calculation relates to a levy to **internalise subsequent climate costs**.

For this purpose, a Pigouvian tax is applied. This internalises the costs of the impact that livestock farming has on the climate. Calculated on the basis of €180 per tonne of CO₂e, this results in costs of €540 for a cow, €108 for a pig and €9 for a chicken, converted to one year. This would result in a total levy volume of €10 billion per year if no adaptation measures were taken. It would thus be possible to use the revenue not only to finance the animal welfare measures recommended by the Livestock Competence Network, but also to invest the remaining levies in climate change

measures. However, due to rising production costs, a reduction in the number of animals is to be expected, which, in turn, leads to falling tax revenues.

➤ Legal and administrative feasibility

When designing and applying economic instruments, conformity with EU law and the Basic Law must be observed. A detailed discussion of the precondition for the legality of levies on livestock and animal products is presented in FÖS 2020 (Chapter 4). At the European level, any discrimination against other European producers would be unlawful (cf. e.g. prohibition of discrimination under customs law, prohibition of discrimination under tax law, prohibition of competition-distorting subsidies). Since the levies conceived within the context of this study would have no influence on production costs outside Germany, legal conformity can be assumed here. At the national level, the criteria of suitability, necessity and appropriateness must be met. This means, for example, that a levy must not significantly exceed its financing purpose. According to Article 20a of the German Basic Law, animal welfare and climate protection are legitimate goals, and economic instruments that pursue these goals and contribute to their realisation are lawful (FÖS 2020).

Furthermore, a tax must not have a “stifling” effect, i.e. it must not bring a certain economic activity (in this case, for example, commercial livestock farming) to a complete standstill. For practical application, the bureaucratic hurdles should not be too high and should, ideally, be able to be integrated into existing reporting structures. This is the case, since the levies are designed to start early in the production process. Farmers are already required to report their livestock on a regular basis, and most farms are also obliged to draw up a material flow balance. Thus, the documentation obligation already exists and may only need to be extended by a few details. The extra effort needed is kept within narrow limits.

➤ Discussion and conclusion

The use of economic instruments in the agricultural sector can have various legitimate purposes:

- Acquiring funds for animal welfare measures.
- Achieving the reduction targets for air pollutants and limit values for GHG emissions.
- Internalising external costs. The emission of air pollutants causes considerable consequential costs in the health sector.
- Initiating the transformation process.
- Rewarding environmental and climate protection measures.

Depending on the goal being pursued, different economic instruments are best suited. First of all, it must be determined at which point in the production and consumption chain the levy should be applied. A levy that is collected early in production, i.e. from the farmers, provides the greatest incentives to initiate the urgently needed agricultural turnaround. This is particularly true if the revenue is used to promote or reward sustainable behaviour (in terms of environmental and climate protection, but also as regards species-appropriate husbandry). However, such a levy would also generate the greatest resistance in the farming community, which already finds itself barely able to cover its costs with the sale of animal products due to price pressure. This is partly self-inflicted, since in the past farmers have focused on growth in the hope of tapping export markets. However, the strategy has so far proved unprofitable, as the large supply is depressing prices.

For this reason, there are calls for taxes at the end of the consumption chain to be designed as a consumption tax, so that the buyers of animal products pay for the tax. The funds should then flow

into the agricultural sector, e.g. in the form of support for animal welfare measures. Potentially flanked by regulatory law which, after a transitional phase of several years, prohibits certain forms of husbandry in the long term, a transformation is to be initiated which, at the present time, is not manageable for many farmers using their own resources. When deciding where a levy should be applied, it ultimately comes down to weighing up political interests. If the aim is to implement a levy with a moderate effect but with the highest possible acceptance and the lowest possible resistance, then a consumption tax with subsequent use of the funds for animal welfare measures under the specification of environmental standards is suitable. So as to avoid any rebound effects, care must be taken when designing support measures to ensure that a reduction in livestock is also a prerequisite for financial support, so as not to create incentives to produce more. The “butter mountains” and “milk lakes” from the time when farmers still received subsidies depending on their output are still recalled by many.

If, on the other hand, it is to be ensured that the environmental and climate targets promised in various agreements are achieved, a much earlier start must be made. If a levy were to be imposed on extreme forms of livestock farming with high stocking densities, this very intensive livestock farming method would no longer be economically viable and a reduction in livestock numbers would be unavoidable. The use of the funds should be used to support the transformation process in order to support farmers when transitioning to a less livestock-intensive business.

Of course, a combination of both forms of levy is also conceivable. An excise tax that collects funds for animal welfare measures from the end consumer and an air pollution levy that, for example, prices ammonia emissions at the producer's end. This way, the acquisition of funds outside the sector could be combined with the steering effect within the sector. However, it can be assumed that, in this case, media coverage would be quite critical, since the topic of meat consumption is emotionally charged in parts of the population and certain waves of indignation almost inevitably accompany the attempt to reduce the production and consumption of food products of animal origin. This is especially the case if this is done by making meat and dairy products more expensive. The goal of increasing animal welfare can contribute to acceptance here, since many consumers want a more species-appropriate form of husbandry. However, further price increases for environmental protection would have to be explained in detail in order to make their justification understandable. Here, it would make sense to point out the high environmental, climate and health costs that currently have to be borne by society as a whole and that are not levied according to the polluter-pays principle.

Conclusion and policy implications

With the study at hand, DUH advocates levying taxes on excessively high emissions of air pollutants from livestock farms to complement the implementation of the consumption-based and animal welfare increasing Borchert approach so as to gradually internalize the external costs of intensive livestock farming. We specifically propose the following:

- » The definition of concrete guiding principles for livestock farms. A **supplement to the Borchert Commission's proposal** should bring its implementation forward in time and achieve **mitigation effects in the areas of climate protection and air pollution control**.

- » Prompt and consistent efforts to reduce livestock numbers as well as the overproduction of meat and milk are required in order to meet both the binding **ammonia reduction obligation** under the EU NEC Directive and the **climate protection targets** by reducing highly potent greenhouse gases. This should also result in positive income effects for the farms that make the switch.
- » On the basis of the options presented in the study, it makes **sense to supplement the Borchert approach by production based instruments**. The meat tax levied on consumers must be complemented, especially since it has no steering effect on animal production for export. It is thus essential to consider levies at the production level in order to price in external environmental costs. This applies in particular if the consumption of animal products continues to fall, but production does not decrease to the same extent, but flows into exports.
- » **Producers must be financially supported in this transformation process with funds from the meat levy and redistributed EU subsidies**. On the other hand, those who do not carry out measures to reduce emissions of air and climate pollutants and animal welfare can be encouraged with levies to reduce livestock numbers and gradually switch to more environmentally and animal-friendly husbandry methods.
- » A **progressive levy based on air pollutant emissions**, in particular ammonia, can support compliance with the binding reduction targets for various air pollutants (EU NEC Directive) by 2030. The progressive approach enables a **fair transformation process based on the 2 LSU/ha target** (livestock units per hectare) and creates guiding principles for the transition to more sustainable livestock farming.
- » This progressive levy on polluted air has the **greatest steering effect because it represents an operational limit for meat and milk production**. Similar to earlier instruments for limiting quantities (e.g. EU milk quota), it can and should thus help to gradually reduce surplus quantities and thus, at the same time, relieve the burden on the environment and the market or improve producer prices. In this context, it is essential for the preservation of as many farms as possible to carry out the above-mentioned targeted promotion of the conversion of livestock farming from the meat levy in a short-term and unbureaucratic manner.
- » In order to prevent the import of animal-based foodstuffs that continue to generate high external costs but appear cheaper when measured against the market price, **levies must likewise be imposed on these imported products**.

Climate protection, air pollution control and animal welfare cannot be delayed any longer. In order to meet important requirements from the national climate protection law and the EU NEC Directive, the DUH calls on the new federal government to use targeted and effective economic control instruments.

