Recommendations for the introduction of a national animal welfare monitoring system in Germany

6 steps for implementation

Nationales Tierwohl-Monitoring

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Nationales Tierwohl-Monitoring

May 2024

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Preamble

Animal welfare is a topic of high importance to EU citizens. In the most recent Eurobarometer survey, the question 'How important is it to protect the welfare of farmed animals?' was answered with 'important' by 93% of the interviewees.[01]

Yet, as there is little information available on this subject, it is not possible to describe the status quo or assess the development of animal welfare in the European Union. This is problematic because the 'lack of accurate data on animal welfare [...] prevents Member States from designing relevant CAP Strategic Plans for interventions'[02] and makes it difficult to evaluate the effectiveness of EU legislation on farm animal welfare.[03]

The authors of this report therefore strongly believe that there is a need for animal welfare monitoring at EU level. The conceptual work carried out in the 'NaTiMon' project for Germany cannot be transferred one-to-one to the entire European Union. Member States have their own systems of data collection and data recording. In addition, farms and their structures differ as does the overall food processing. On the other hand, there are many similarities: for instance, each EU Member State has a recording system for milk and dairy production, and in each Member State official veterinarians are present at ante- and post-mortem inspection during slaughter. All countries have organisations which can perform animal welfare audits to collect data on animal welfare. However, data collection has not yet been started, and available data is not used for the purpose of animal welfare monitoring.

We hope that the work conducted in this project will provide valuable input to the process of implementing an animal welfare monitoring system in the European Union.

01 European Commission, Brussels (2023): Eurobarometer. Attitudes of Europeans Toward Animal Welfare.

02 Agrosynergie (2021): Study on CAP Measures and Instruments Promoting Animal Welfare and Reduction of Antimicrobials Use. Final Report for the European Commission. p. 151.

03 Dusel S, Wieck Ch (2023): Evidence gaps hinder animal welfare progress in the European Union. Nature Food, 4, pp. 348–349.

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Summary

As part of the ‘National Animal Welfare Monitoring’ (NaTiMon) project, a consortium of 10 institutions developed a concept for the regular and systematic assessment of animal welfare in livestock farming for Germany.

With the involvement of stakeholders, suitable indicators were selected, possibilities for the use of existing data were identified and procedures for the collection of missing data developed. Indicators for an assessment of animal welfare in husbandry, transport and slaughter of cattle, pigs, chickens, turkeys, sheep and goats from terrestrial livestock farming and of rainbow trout and common carp from aquaculture were included as well as indicators describing conditions of livestock farming.

The following steps are recommended for the implementation of a future national animal welfare monitoring system:

(1) Create a legal basis

(2) Provide an institutional basis and infrastructure

(3) Provide funds for implementation

(4) Enable the use of existing data

(5) Implement the collection of missing data

(6) Publish an animal welfare monitoring report

Animal welfare in Germany

Why do we need a standardised, national animal welfare monitoring system?

The European Union and its Member States currently have no comprehensive, representative data basis on animal welfare in livestock farming. A consistent animal welfare monitoring system can provide an objective picture of the status quo and the development of animal welfare; it can furthermore identify the most urgent animal welfare problems in terrestrial livestock farming and aquaculture.

The data from animal welfare monitoring can also be used to:

- Evaluate the effectiveness of government policies, such as animal welfare premiums, investment support and animal husbandry labelling.
- Analyse the possible influence of factors such as husbandry methods, farming systems (organic or conventional), herd sizes and management measures.
- Assess whether 'scandalous reports' on conditions in livestock farming in the media relate to individual cases or to frequently occurring problems.

For these reasons, the implementation of national animal welfare monitoring in Germany has repeatedly been recommended in the past:

2005 Scientific Advisory Board on Agricultural Policy at the Federal Ministry of Food and Agriculture (Report)

2012 Steering group for livestock farming at the Conference of Agriculture Ministers

2015 Scientific Advisory Board on Agricultural Policy at the Federal Ministry of Food and Agriculture (Report)

2016 Animal welfare competence group of the Federal Ministry of Food and Agriculture

2020 Competence network for livestock farming ('Borchert Commission')

2021 Committee for the future of agriculture

Figure 1: Recommendations and expert opinions on the need for implementation of a national animal welfare monitoring system by various bodies in Germany

National animal welfare monitoring would also contribute to the animal health strategy envisaged in the coalition agreement of the current federal government.[04]

Because the terms 'animal welfare' and 'indicators' are frequently used in this document, they are defined in the following chapter.

04 'We are developing an animal health strategy and establishing a comprehensive database (including processing plants for animal by-products)'. Coalition agreement 2021–2025 between the Social Democratic Party of Germany (SPD), Alliance 90/The Greens and the Free Democrats (FDP), p. 35.

What does animal welfare mean and how can it be measured?

Animal welfare encompasses the dimensions of health, behaviour and emotions of animals and can be measured using indicators.

The term **animal welfare** focusses on the state of the animals and their needs, whereas **animal protection** refers to the measures taken to ensure animal welfare, e.g. to legal and regulatory measures.[05]

The various aspects of animal welfare can be divided into three overarching dimensions: *basic health and functioning, natural living* and *affective states* (see Figure 2).[06] These dimensions overlap to some extent. For example, both illnesses and the existing or limited ability to perform natural behaviour have an impact on emotional well-being. However, they are also partly independent of or even in competition with one another. The ability to perform natural behaviour through access to pasture can for example lead to health risks caused by predators. However, there is now widespread agreement that all three dimensions must be included into a comprehensive framework for a broadly accepted assessment of animal welfare.[07]

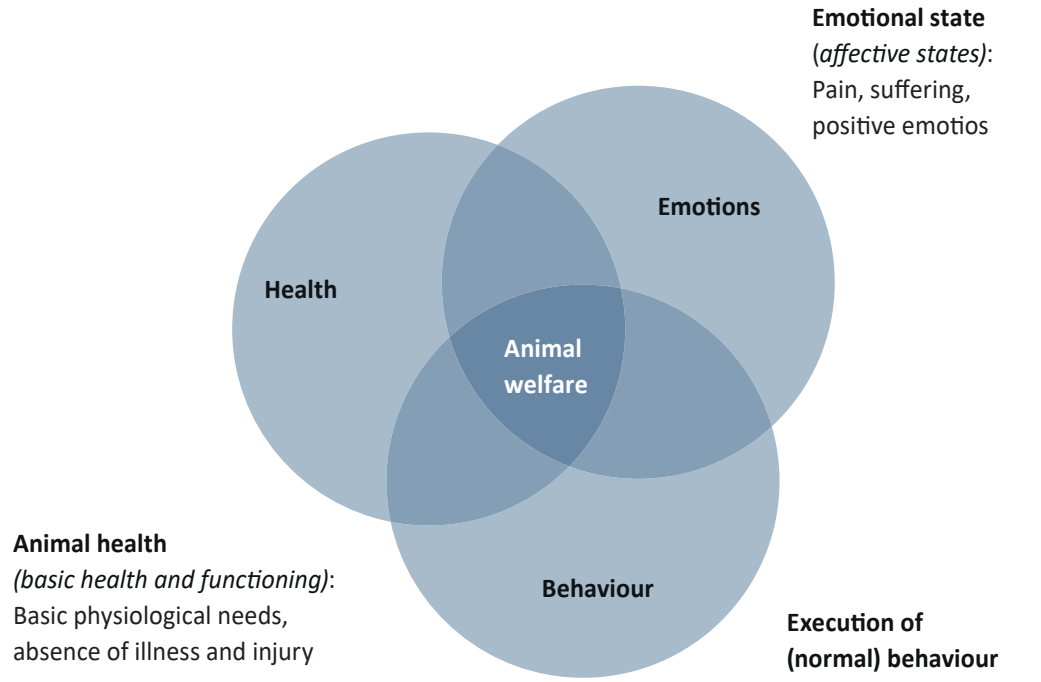

Figure 2: The concept of the three dimensions of animal welfare (adapted from Fraser 2008[08])

Another recognised definition of animal welfare is the *Five Freedoms of the Farm Animal Welfare Council (FAWC)*[09], which are usually listed together with the measures necessary to achieve them and have now been supplemented by corresponding animal welfare objectives[10]:

(1) Good nutrition: freedom from hunger, malnutrition and thirst. The animals have access to fresh water and species- and age-appropriate feed of good quality and in sufficient quantity.

05 Scientific Advisory Board on Agricultural Policy (WBA) at the Federal Ministry of Food and Agriculture (BMEL) (2015): Wege zu einer gesellschaftlich akzeptierten Nutztierhaltung, p. 89.

06 Duncan I J H, Fraser D (1997): Understanding animal welfare. In: M C Appleby and B O Hughes (eds.): Animal Welfare. Wallingford, UK, pp. 19–31.

07 Federal Ministry of Food and Agriculture (BMEL) (2019): Nutztierstrategie. Zukunftsfähige Tierhaltung in Deutschland (Livestock strategy. Sustainable animal husbandry in Germany).

08 Fraser D (2008): Understanding animal welfare. In: Acta Veterinaria Scandinavica, 50 (Suppl 1). The role of the veterinarian in animal welfare. Animal welfare: too much or too little? The 21st Symposium of the Nordic Committee for Veterinary Scientific Cooperation.

09 Farm Animal Welfare Council (FAWC) (1979): Farm Animal Welfare Council Press Statement.

10 See e.g. Mellor et al. (2016): Moving beyond the 'Five Freedoms' by updating the 'Five Provisions' and introducing aligned 'Animal Welfare Aims'. Animals, 6 (10), 59.

(2) Good housing: freedom from discomfort and exposure. The animals are suitably housed; for example, they have access to comfortable resting areas as well as a shelter.

(3) Good health: freedom from pain, injury and disease. The health and integrity of the animals are maintained by preventive measures; sick and injured animals are treated early or in good time; amputations are avoided or conducted with anaesthesia and analgesia.

(4) Positive mental experiences: freedom from fear and stress. Fear and stress are avoided and the possibilities for positive emotions created through good handling of the animals and adequate housing conditions.

(5) Species-appropriate behaviour: freedom to express normal behaviour. The animals can perform their own species-specific behaviour (normal behaviour), e.g. by having enough space, no restraint/tethering, company of the animal's own kind, contact to outside climate.

The concept of the three dimensions[11] and the concept of the *Five Freedoms* of the FAWC[12] are also adopted by the World Organisation for Animal Health in its definition of *animal welfare*.[13]

An important aspect in this context is that the different dimensions or freedoms do not offset one another. A good supply of food and water, for example, cannot compensate for the lack of opportunities to perform normal behaviour.

Measuring animal welfare with indicators

Various indicators are used to measure animal welfare. A distinction can be made between animal-based, resource-based, and management-based indicators.

- Indicators of health status, behaviour or emotional state can be recorded on the animal itself, e.g. lameness, resting behaviour or fear reactions. These animal-based indicators tell us how the animal is doing and allow us to draw conclusions about the effects of husbandry, feeding and management on animal welfare.
- Resource- and management-based indicators consider aspects of the animal's environment, e.g. available space and the design of lying areas, and of the management, e.g. interventions on the animals. They describe the conditions under which the animals live and allow drawing conclusions about the animals' welfare: for example, an animal undergoing a procedure such as castration without anaesthesia feels pain, and an animal that is restrained (such as cows in tie stalls or sows in farrowing crates) or has very little space available cannot perform its normal behaviour.

11 Fraser D 2008.

12 Farm Animal Welfare Council (FAWC) 1979.

13 World Organisation for Animal Health (WOAH, founded as OIE) (2022): Terrestrial Code https://www.woah.org/en/what-we-do/standards/codes-and-manuals/terrestrial-code-online-access/?id=169&L=1&htmfile=chapitre_aw_introduction.htm

The ‘National Animal Welfare Monitoring’ (NaTiMon) project

In the livestock farming strategy[14] published by the German Federal Ministry of Food and Agriculture (BMEL)[15] in 2017, the Federal Livestock Farming Programme was created and the design of an animal welfare monitoring system was defined as a task. From spring 2019 to summer 2023, a consortium of members from 10 institutions developed a concept for the implementation of such a monitoring system in the ‘National Animal Welfare Monitoring’ (NaTiMon) project on behalf of the BMEL.

Figure 3: The NaTiMon project consortium
Photos: © Thünen-Institute / Nina Heil, Cantu Perez, Katja Krugmann, Edna Hillmann, Michael Welling.

[14] Federal Ministry of Food and Agriculture (BMEL) (2017): Livestock farming strategy. Sustainable livestock farming in Germany.

[15] Federal Ministry of Food and Agriculture (BMEL) (2019): Livestock strategy. Sustainable livestock farming in Germany.

One of the most important tasks in the NaTiMon project was the selection of suitable indicators for a future animal welfare monitoring system. The following tasks were performed for this purpose:

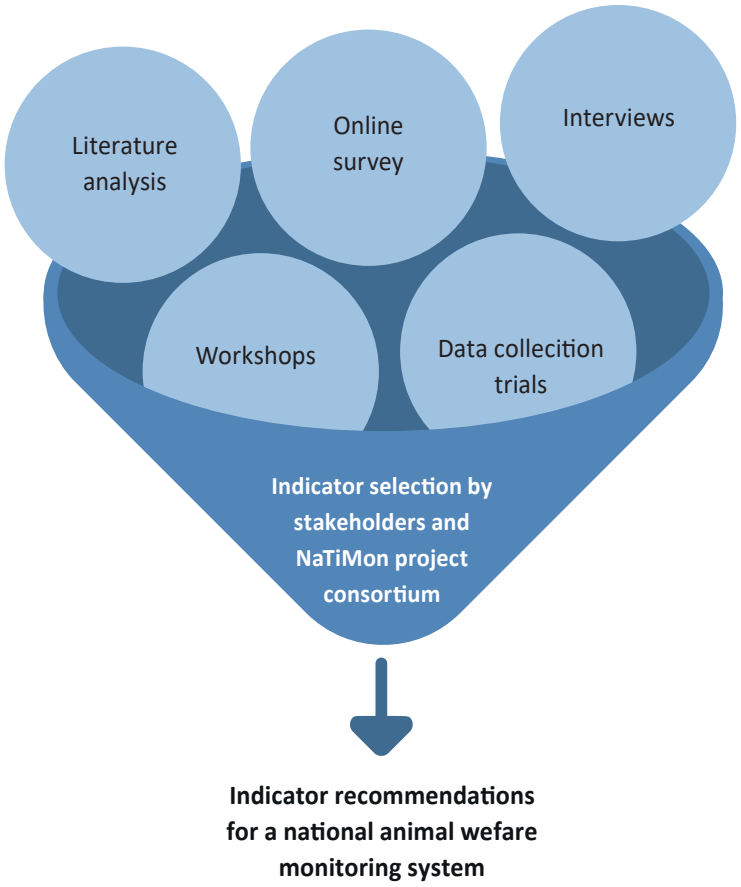

Figure 4: Tasks for selecting indicators for national animal welfare monitoring in the NaTiMon project

- Analysis and evaluation of the indicators described in the literature with regard to their suitability for national animal welfare monitoring for cattle, pigs, poultry, sheep, goats, common carp and rainbow trout by the project consortium.
- Realisation of workshops, interviews and regional conferences with stakeholders. These events enabled us to obtain information on unpublished indicators (e.g. from advisory services or animal welfare labels) and discuss the suitability of indicators with experts.
- Implementation of an online survey or, in the case of aquaculture, expert discussions on the suitability of specific indicators for a national animal welfare monitoring system. This approach enabled the involvement of a broad range of stakeholder expertise in the selection of indicators.
- Conducting data collection trials for the pre-selected indicators at agricultural holdings, aquaculture farms, control posts, collection centres, slaughterhouses and rendering plants.[16]
  - Written survey: The design of the written survey was based on statistical questionnaires, such as those used in the agricultural census. The aim of the written trial survey was to test which indicators are suitable for this type of survey. In total, 147 companies took part in the written survey completing 241 questionnaires, which covered husbandry indicators (162), context-indicators (56), and indicators for control posts, collection centres and slaugh-terhouses (23).
  - Audits: Testing the practicability and reliability as well as the time required to collect a set of indicators. The audits were conducted on 105 livestock farms (including aquaculture farms), at control posts, collection centres and slaughterhouses (20), and at rendering plants (10).
- Evaluation of all results and selection of a set of indicators for national animal welfare monitoring by the project consortium.[17]
- A key criterion for the definition of the indicator set was to ensure the inclusion of all dimensions of animal welfare. A future animal welfare monitoring system should not only assess the dimension of animal health, but also consider animal behaviour and the emotional state of the animals. In addition, the aspects of ‘good nutrition’ and ‘good

[16] Context-indicators of animal welfare assess legal and socio-economic aspects that are associated with animal husbandry.

[17] For aquaculture, the selected indicators were also presented and discussed with experts and stakeholders at this time.

accommodation' described in the concept of the *Five Freedoms* should be included. At the level of the individual indicators, several selection criteria were applied. The most important ones were:

- The scientific criteria 'validity' and 'reliability'.
- The practicability of the survey. This refers to both the implementation within the operational processes (an indicator that can only be recorded at a very specific, rarely occurring time point is not suitable) as well as the time and effort associated with the survey.
- The relevance of animal welfare aspects, which refers not only to the frequency of occurrence of the welfare aspect to be measured (a national monitoring system will not be suitable for highlighting rarely occurring animal welfare issues), but also to the importance for the animal (severe restrictions in animal welfare will receive a higher ranking).
- The current availability of data was not a criterion for the indicator selection. However, if a future data collection was judged to be very unlikely, e.g. because of an extremely time-consuming survey, this aspect was included as a criterion in the selection of indicators.

As a result of the NaTiMon project, we recommend a set of indicators for future national animal welfare monitoring (see the list of recommended indicators in the appendix). These indicators allow for an animal welfare assessment in husbandry, transport and slaughter.[18] They also include context-indicators that describe the legal and socio-economic environment of animal husbandry.

[18] The production section where an indicator is recorded and the production section for which the indicator makes a statement do not have to be identical. For example, many animal health indicators (such as pneumonia or pericarditis in pigs) are recorded at the slaughterhouse but relate to the animal's life on the farm.

Whereas individual indicators can be calculated from existing data (provided there is an authorisation to use the data), suitable data are not yet available for many of the indicators (see Figure 5). As part of the NaTiMon project, recommendations were developed as to how access to data can be established and how data that has not yet been collected can be recorded.

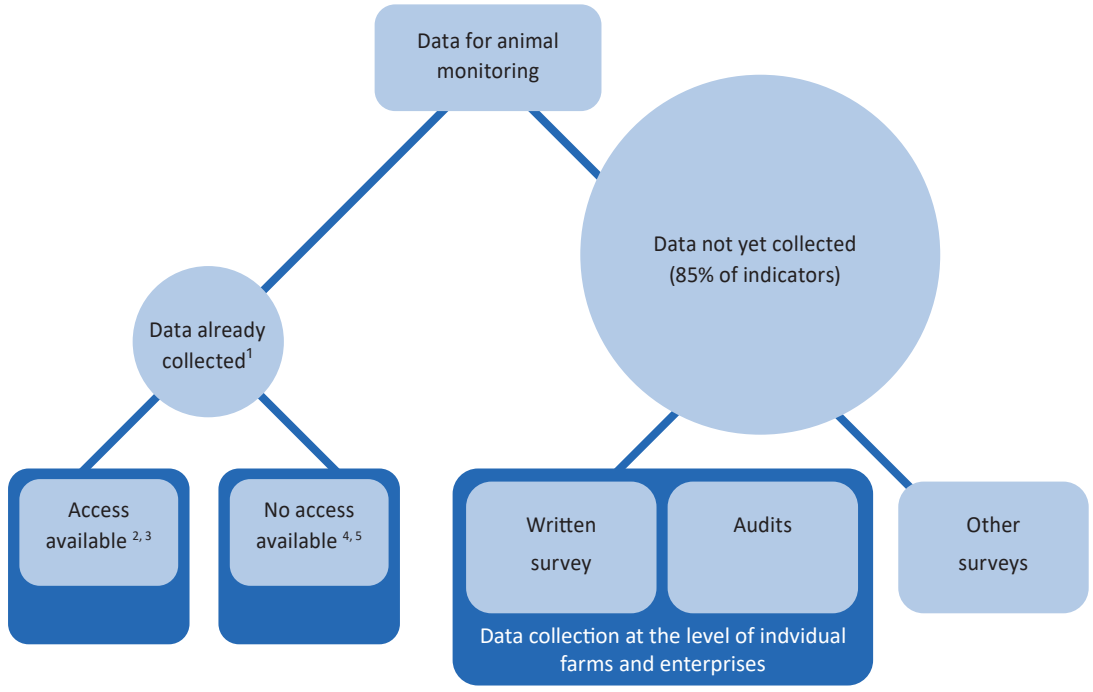

Figure 5: Current data availability for indicators recommended for future national animal welfare monitoring.[1] 15% of indicators,[2] agricultural census (Landwirtschaftszählung - LZ) of the federal and state statistical offices,[3] agricultural structure survey (Agrarstrukturerhebung - ASE) of the federal and state statistical offices,[4] traceability and information system for animals (HIT),[5] food safety scheme (QS).

As part of the NaTiMon project, the production sections of husbandry, transport and slaughter of cattle, pigs, chickens, turkeys, sheep, goats, rainbow trout and common carp were investigated. Animal species such as geese and ducks, as well as rabbits, are missing for a complete overview of animal welfare in livestock farming. It was also not possible to cover individual production systems or husbandry methods for the animal species studied as part of the project. This applies, for example, to suckler cows, but also to parent animals in poultry farming and to recirculation systems in aquaculture. The development and selection of suitable indicators for these areas could be achieved in the future through a corresponding research funding programme.

NaTiMon results and reports (in German)

A **literature database of animal welfare indicators** provides an overview of the indicators described in scientific literature for measuring animal welfare (www.ktbl.de/webanwendungen/literaturdatenbank-tierwohlindikatoren).

The methodology for the collection of indicators through audits is described in **survey guidelines.**

The methodology for a written survey as well as the presentation and calculation of all indicators are explained in **methods manuals**. Survey guidelines and method manuals also contain all relevant literature sources.

Model reports for selected indicators visualise how the animal welfare information can be presented in a future animal welfare monitoring system.

The **recommendations** in the present document explain the steps required to implement a national animal welfare monitoring system.

All tasks of the project, such as the procedure for selecting the indicators and relevant background information, are published in the **project report.**

All documents can be downloaded from
www.nationales-tierwohl-monitoring.de

6 steps for the implementation of a national animal welfare monitoring system in Germany

1 Create a legal basis

As part of a national animal welfare monitoring system, access to existing data sources is required and data must be collected and evaluated. The precondition for the implementation of national animal welfare monitoring is therefore the creation of a legal basis.

To generate the information required for future national animal welfare monitoring, surveys on animal welfare must be conducted on farms, in aquaculture, at control posts and collection centres, in slaughterhouses and at rendering plants. Links with other data sources and surveys are necessary to avoid duplicate surveys and to allow for analyses of interdependencies. One example for an existing database which contains valuable information for animal welfare monitoring but cannot be accessed for this purpose is the cattle registry (traceability and information system for animals), in which cattle farms enter information on births, deaths and causes of death etc. on the level of the single animal.

Some of the information which needs to be collected for animal welfare monitoring is personal data, meaning that its collection and evaluation are subject to strict data protection regulations. The General Data Protection Regulation lists the following options for the use of such data:[19]

- Consent of the data subject.
- Legitimate interest in processing.
- Legal obligation.
- Performing a task of public interest.

[19] Expertise on the legal requirements for the implementation of national animal welfare monitoring, prepared on behalf of the Johann Heinrich von Thünen Institute of Farm Economics (2023) by Dentons Europe (Germany) GmbH & Co. KG.

These options are out of the question for future national animal welfare monitoring:

- Only some of the farms would consent to a voluntary animal welfare audit, and it cannot be ensured that these farms are representative of the population of all livestock farms.
- Companies can claim a ‘legitimate processing interest’ if, for example, they request the addresses of buyers in order to send goods; this is not an option for a government agency.
- There is no legal obligation to collect and evaluate animal welfare data, as there are no corresponding reporting obligations.
- A task may be performed in public interest, for example in the case of public health or humanitarian emergencies such as natural disasters.

There is also currently no suitable legal basis for access to existing data because neither access in accordance with Section 2a (2) No. 4 of the German Animal Welfare Act nor the Act on the Regulation of Access to Federal Information or the regulations on administrative assistance can be applied.

A legal basis must therefore first be created for the implementation of national animal welfare monitoring. The following procedures can be considered:

- Enactment of a formal parliamentary law: The Federal Ministry of Food and Agriculture drafts an animal welfare monitoring law and submits it to the Federal Parliament (German Bundestag).
- Authorisation of the Federal Government to issue an ordinance: Enactment of a law by the German Bundestag authorising the Federal Ministry of Food and Agriculture to issue a statutory ordinance (e.g. as an amendment to the Animal Welfare Act). This approach would avoid the German Bundestag having to deal with detailed questions regarding the implementation of national animal welfare monitoring.

An animal welfare monitoring law or a corresponding legal regulation would create the conditions for the implementation of animal welfare monitoring by:

- Ensuring access to existing data.
- Creating the conditions for improving the quality of existing data sources.
- Enabling the linking of different data sources (data collected in a future national animal welfare monitoring system and existing data sources).
- Adapting or expanding statistical legislation (e.g. inclusion of a separate animal welfare survey or adaptation of existing surveys)[20] and thus creating the legal basis for implementing a mandatory written survey by the federal and state statistical offices.
- Establishing the conditions for access to the terrestrial farms, aquaculture farms, control posts, collection centres, slaughterhouses and rendering plants to conduct audits for data collection.
- Enabling the analysis of personal data.

[20] Agricultural Statistics Act (AgrStatG) and other statistical regulations (FlUStatV etc.).

2 Provide an institutional basis and infrastructure

An institutional infrastructure is required for a future national animal welfare monitoring system. The monitoring can be implemented by the statistical offices, federal research institutes and certification bodies.

The preparation and implementation of national animal welfare monitoring involves a number of tasks, such as statistical sampling for the surveys, organisation and implementation of written surveys and audits, and the programming and operation of an animal welfare database (see Figure 6).

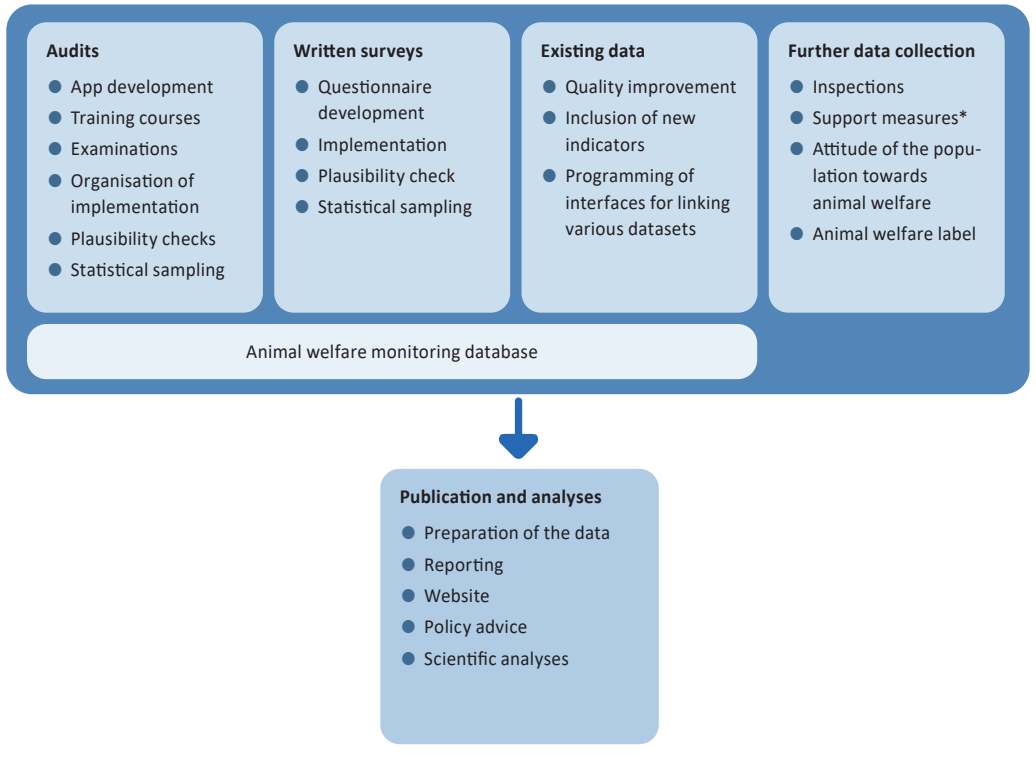

Figure 6: Tasks in the implementation of a future national animal welfare monitoring system
* Support measures include programmes of the EU's Common Agricultural Policy (CAP) as well as national and regional measures.

Certification bodies: To make use of existing skills and structures, we recommend that audits be conducted by established the certification bodies (see section 5.1). They have expertise in the planning and implementation of audits on farms and in slaughterhouses and the recruit-ment and qualification of suitable specialists. By delegating this task to established certification bodies, the precondition to avoid multiple visits to the same operation for different auditing purposes (e.g. food safety scheme [QS] audits, organic inspection, animal welfare monitoring) can be created.

Federal and state statistical offices: The sampling for the written survey and for the audits is based on information from the farm register and must therefore be conducted by the statistical offices. We recommend that the written (online) surveys should be prepared and conducted by the federal and state statistical offices. The implementation of these surveys will be similar to the statistical surveys already conducted regularly (e.g. agricultural structure survey, agricultural census) or could be partially integrated into existing surveys. The remit of the statistical offices would also enable linking existing statistical data with the data of a future animal welfare monitoring system. In addition, the Federal Statistical Office can provide advice on setting up the data structure for the audit surveys so that the data can also be used for further statistical analysis.

Federal research institutes: The Federal Ministry of Food and Agriculture's research institutes are qualified for many of the other tasks listed, including the organisation of audit surveys. They are already responsible for various monitoring activities, such as soil status surveys, biodiversity monitoring, monitoring of commercially exploited fish stocks or the monitoring of animal diseases.

The Thünen Institute has many years of experience in policy evaluation and linking various data sources. In addition, it has the necessary expertise to perform tasks such as app development, training, testing, organisation of audit surveys and the use of data from existing databases for the livestock species cattle, sheep and goats (Thünen Institute of Organic Farming) and for common carp and rainbow trout from aquaculture (Thünen Institute of Fisheries Ecology).

The Friedrich-Loeffler-Institute for Animal Welfare and Animal Husbandry has the relevant expertise and experience to perform the tasks mentioned for the livestock species pigs and poultry and for the areas of transport, slaughter and rendering.

The Thünen Institute of Farm Economics could coordinate the work across the different animal species and be in charge of the data collection and analysis for the context-indicators, which include animal welfare support measures, consumer attitudes and animal welfare legislation.

These two federal research institutes (Thünen Institute, Friedrich-Loeffler-Institute) could be jointly responsible for the operation of the database and would also have the task of creating a suitable infrastructure to enable the evaluation of anonymised data. Reporting, which must be done regularly and in accordance with scientific quality criteria, would also be a joint task of the federal research institutes.

External committees: The accompanying establishment of two committees is recommended for the implementation of animal welfare monitoring. The task of one committee would be to incorporate new findings from science and practice into the selection of indicators for monitoring, while the second committee would be responsible for selecting the indicators for reporting (see p. 49).

The commissioned institutions would have to be financed for the new tasks.

3 Provide funds for implementation

The collection of data, data processing, evaluation and publication are associated with costs. Appropriate funding must be made available for the implementation of national animal welfare monitoring.

The costs of implementing a consistent national animal welfare monitoring system depend largely on how the monitoring is ultimately structured.

For **written surveys**, an estimate of the compliance costs[21] can only be calculated by the statistical offices once all framework conditions are known and a draft law for the implementation of animal welfare monitoring is available. An exemplary calculation for the integration of animal welfare–relevant characteristics into an existing survey can be found in the project report. An important cost factor is the number of farms to be surveyed and whether a separate survey is necessary or integration into an existing survey is possible (integration into the livestock survey would be possible for pigs and sheep, for example)[22]. In general, a newly introduced survey requires onetime costs for the development, testing and programming of evaluation routines. When the survey is conducted regularly, costs are incurred for answering queries from farms, for correcting potentially incorrect information and for reminding farms to participate in the survey. The onetime costs for setting up separate animal welfare surveys are higher than those for integrating them into existing surveys.

[21] Pursuant to Section 2 (1) NKRG (German law for the implementation of a national regulatory council), compliance costs comprise the total measurable time and costs incurred by citizens, businesses and the public administration as a result of compliance with a provision of federal law.

[22] To date, official statistics have not included any primary stock surveys for cattle, poultry and goats or for transport and slaughter, so there is no possibility of integrating animal welfare–relevant characteristics into existing surveys.

Regardless of whether the written animal welfare survey is integrated into existing statistics or a new survey is designed, additional permanent staff is required to expand the tasks of official statistics.

For the **organisation and implementation of the audits, data storage, processing and analysis of the data and the reporting**, a cost estimate was made on the basis of the estimated sample sizes (which are explained in section 5.1), using current prices and personnel costs. Information for an exact estimation of future costs is not available: sample sizes will change over time owing to structural changes in the sector; furthermore, salaries of employees or the costs for database programming are subject to developments which are difficult to predict. The actual costs for future audits will therefore deviate from the stated values. The most important cost factors for the implementation of national animal welfare monitoring – with the exception of sampling and written surveys by the statistical offices – are listed in Table 1.

Table 1: Estimate of the costs of organising and conducting audits, storing, processing and analysing the data, and reporting on future national animal welfare monitoring.

	Implementation	Annual costs
Audits	Certification bodies and auditors	€ 1.9 million
Coordination, data management, evaluation and reporting	Federal research institutes	€ 0.9 million
Written surveys	Federal and state statistical offices	to be determined[1]

Source: Own calculations, Thünen Institute of Farm Economics

[1] An estimate of the compliance costs can only be made by the statistical offices once all the framework conditions are known and a draft law on the implementation of a national animal welfare monitoring system is available.

Certification bodies and auditors: Audit surveys on the farms

Based on the estimation of the sample sizes for current farm and animal numbers, around 14,300 audit days would be required at present for the proposed data collection cycle of an animal welfare monitoring system of four years. This figure deviates from the estimated number of audits (see section 5.2) because the audits in slaughterhouses and at rendering plants must be conducted by two people (partly for occupational safety reasons, partly because of the methodology of indicator recording). Based on the remuneration in the public sector[23] and standard market costs for equipment and training, an audit day was estimated to cost approximately 510 euros. Adding the planning costs, this results in annual costs of 1.9 million euros (see Table 1).

[23] Assumption: tariff E9b, level 3. The certification organisations use other remuneration keys that were not available for the cost calculations and may deviate from the calculated costs.

Federal research institutes: Preparation and coordination of audits and other surveys, data management, reporting

Overall coordination is required for the preparation and organisation of the audit surveys. The recorded and collected data must be evaluated for reporting on future monitoring. Existing data must be retrieved and linked to the collected data. On this basis, calculations required for the indicators can be performed. In addition, the information must be checked for plausibility before it is used for calculations and incorporated into analyses and reports. The reports must be created and prepared for publication in collaboration with a graphics agency.

Six full-time positions are required in the Federal Ministry of Food and Agriculture's research institutes for the organisation of the surveys (including preparation of the training courses), the plausibility checks and the programming and management of the animal welfare database, the linking with existing data sources, the implementation of a website and the reporting of the results of the national animal welfare monitoring[24]. For the total number of positions, the cost amounts to 0.6 million euros per year. Other cost factors are:

- The programming and operation of a database in which all animal welfare monitoring data are stored.
- Programming an app as a data input option for the auditors.
- Programming a web user interface for transferring the data collected during audits and written surveys and programming interfaces for entering existing data.

The calculated costs amount to 500,000 euros per survey cycle and 20,000 euros per year for maintenance and operation of the database. For the committees involved in a future national animal welfare monitoring system (see sections 5.2 and 6), an amount of 28,000 euros per survey cycle is estimated for the reimbursement of expenses. A total of 548,000 euros is budgeted for the design of the reports and the website, as well as the maintenance and upkeep of the website for one survey cycle. Personnel costs and 'other costs' of federal research institutes were thus estimated at 0.9 million euros per year.

[24] The remuneration of the positions depends on qualifications and professional experience. As a general rule, the costs of one position per year were estimated at 107,374 euros with remuneration according to TVöD tariff 14 (employer's gross salary) plus overheads and material costs.

4 Enable the use of existing data

There are already some data available that contain relevant animal welfare information. To avoid duplicate surveys, this information should be used for national animal welfare monitoring.

For reasons of efficiency, it makes sense to use information that is already collected on animal welfare for an animal welfare monitoring. Additionaly other data sources that can serve as reference values for animal welfare indicators, such as the number of animals kept on a farm, need to be included into the monitoring system. To avoid multiple queries, various data sources should be combined for a future national animal welfare monitoring system. This can be done using a uniform farm number (e.g. VVVO or IACS number[25]). For the analysis, the data is separated from the farm number and processed anonymously.

The following public and private data sources contain information needed to calculate the selected animal welfare indicators:

- Statistical data collected by the federal and state statistical offices: In the ante-mortem and post-mortem inspection, official veterinarians collect information on various animal welfare–relevant characteristics for cattle, pigs, sheep, goats and poultry. The results are publicly accessible but they are aggregated (summarised) at district level and not provieded at individual farm level. Information on husbandry methods (dairy cows, sows, laying hens), access to the outdoors (dairy cows, sows) and access to pasture (dairy cows) is recorded in the agricultural census, agricultural structure survey and in the survey of farms with laying hens. Informa-tion on the number of cattle exported to third countries can be found in the foreign trade statistics.
- Data from the official cattle registry, which includes information on all cattle kept in Germany, can form the basis for calculating the indicators ‘mortality’ and ‘longevity’.

25 According to the German Livestock Traffic Ordinance (VVVO), each holding must have a unique holding registration number for each location of the holding. The Integrated Administration and Control System (IACS) is a cadastre for agricultural land and farms which ensures the traceability of payments of the EU’s Common Agricultural Policy.

- Quality and Safety (QS): In the databases of the QS-company, the ante-mortem and post-mortem inspection by official veterinarians and the information collected by slaughterhouse operators are recorded at the level of individual farms.[26] Examples of animal welfare–relevant indicators collected at slaughter include ear and tail injuries and injuries caused by forceful driving of pigs, pregnancy in cattle and pigs, and foot pad dermatitis and sternum lesions in poultry. No data is recorded by QS for sheep, goats and fish.
- The Association for Alternative Housing Systems (KAT) provides information on husbandry methods for laying hens.
- The TRAde Control and Expert System (TRACES) contains information on cross-border animal transports and can provide data for the indicator ‘third country exports’ (countries outside the EU, including high-risk countries).[27]
- Data from the milk recording (MLP) is required for the indicators ‘udder’ and ‘metabolic health’ of dairy cows. These are available on a nationally aggregated basis[28], but not, as required for the analyses, at the level of the individual farm.

There are also other data sources that contain either reference values, e.g. number of animals, for calculating the indicators or information that is important for analysing the factors influencing animal welfare:

- The livestock surveys, agricultural census and agricultural structure survey of the federal and state statistical offices contain information on the number of farms and animals, as well as on the economic activity of the farms. The survey on aquaculture production includes information on the quantity produced by species and rearing method and on the structure of aquaculture farms.

26 These data are aggregated at district level and reported to the Federal Statistical Office, which uses them to compile the ante-mortem and post-mortem inspection statistics. Owing to the aggregation, it is not possible to analyse the data in a farm context and, for example, to answer the question of whether tail biting occurs particularly frequently in certain housing systems.

27 The suitability of the data could not be investigated conclusively as part of the project because no access was made available and no approval for testing was granted. For this reason, the suitability of the data and the possibilities of data retrieval would have to be examined when implementing a national animal welfare monitoring system.

28 Q Check summarises data on animal welfare from the milk recording and evaluates them nationwide once a year. Q Check (2022): https://q-check.org/monitoring/ or Press Release National Animal Welfare Monitoring 2021, https://infothek.q-check.org/elearning/pressemitteilung-nationales-tierwohlmonitoring/.

- Information on the use of antibiotics can be retrieved from the antibiotics database, allowing for an analysis of interrelations between animal welfare indicators and antibiotics use.
- The Integrated Administration and Control System (IACS) contains information on participation in support measures, such as animal welfare premiums, farm investment support and organic farming subsidies, and can be used to evaluate these measures.
- The Farm Accountancy Data Network (FADN) is the representative source of microeconomic data at farm level and the basis for the accounting statistics of the federal and state governments.[29] The accounting is compiled according to standardised procedures. In combination with animal welfare indicators, interrelations between the economic situation of the farms and animal welfare can be analysed.

To date, only the statistical surveys are accessible as data sources for calculating animal welfare information or as background information for animal welfare monitoring. This is because some of the other data sources are private data (milk recording MLP, QS, Association for Alternative Housing Systems KAT) or public data that are not collected to measure animal welfare (HIT, TRACES, antibiotics database). As a result, the data must not be used for national animal welfare monitoring at the present time. A prerequisite for such usage is the creation of a corresponding legal basis (see section 1).

In some cases, the data is not yet available in the form required for national animal welfare monitoring. This applies, for example, to the data from the ante-mortem and post-mortem inspections, which are transmitted to the Federal Statistical Office in aggregated form at district level, or to the milk recording data, which are published in aggregated form at national level. These data would have to be transmitted at farm level to the statistical offices or the bodies responsible for the implementation of animal welfare monitoring.

Farm-level data are the prerequisite for national animal welfare monitoring to not only present the state of animal welfare but to contribute to the evaluation of the effectiveness of policy measures and the analysis of interdependencies of various influencing factors. QS already stores the data of ante-mortem and post-mortem inspections for individual farms. Accordingly, for national animal welfare monitoring, access to these data (either from QS or from the original data of the inspections by official veterinarians) is required. The milk recording data are also stored on an individual farm basis and could be retrieved in this form if legally permitted (authorisation created by an animal welfare monitoring law).

The quality of the data already collected plays an essential role in their usability in the context of future monitoring. It must be ensured that the indicators are collected reliably, meaning that different auditors come to the same result in the survey. The lack of reliability of the ante-mortem and post-mortem inspection by official veterinarians has been documented and analysed in various studies.[30] In the meantime, improvements have been achieved through numerous measures to harmonise data collection.[31] To achieve good reliability of the findings and improve their suitability for future monitoring, close cooperation between the respective working groups and the future working group of a national animal welfare monitoring system is recommended.

[29] The FADN is to be expanded to include information on sustainability and will thus become a ‘Farm Sustainability Data Network’. The data from the German FADN are available to the Thünen Institute of Farm Economics.

[30] See Blaha T and Richter T (2011): Animal welfare in livestock farming. Deutsches Tierärzteblatt 2011, 8, pp. 1028–1038.
Hoischen-Taubner S, Werner C and Sundrum A (2011): Significance of slaughterhouse data for improving animal health. In: Leithold G, Becker K, Brock C, Fischinger S, Spiegel A-K, Spory K, Wilbois K-P and Williges U (eds.): Es geht ums Ganze: Forschen im Dialog von Wissenschaft und Praxis. Giessen. pp. 112–115.
Pill K (2014): Studies on the use of clinical and pathological/anatomical findings at the slaughterhouse for the assessment of animal health and welfare in pig and cattle herds. Dissertation (University of Veterinary Medicine Hanover).

[31] These include, for example, training documents and videos for official veterinarians and official veterinary assistants in the areas of cattle and pigs, which were developed by the Max Rubner Institute and will also be produced for poultry in the future. In addition, the district veterinary offices that are required to provide information as part of the ante-mortem and post-mortem inspection statistics and the veterinary staff responsible for the findings are included in the professional exchange through regular online events (webinars).

Changes and improvements are also necessary for further data sources:

- Information on animal welfare legislation compliance on agricultural holdings has so far been provided at the level of 'premises', which usually refer to one barn, stable or housing unit. Because a farm can consist of one or more 'premises', the information on animal welfare legislation compliance cannot be interpreted adequately. Thus, in future, the inspected 'premises' should be aggregated to the farm level.
- Pig farms are currently obligated to submit an annual report on their pig herd into the HIT system. In addition, transfers of pigs to other farms and to slaughterhouses must be reported. Neither the number of piglets born nor the number of pigs that die or are culled on the farm is currently to be reported. To be able to calculate mortality rates, farms need to report the number of deaths per production stage and the number of piglets born on the farm.
- Cattle farms presently have to report calves only from seven days of age into the HIT system. To calculate early mortality of calves, reporting needs to take place from birth on.
- As an indicator of mortality and as reference for the indicators assessed at rendering plants, the numbers of cattle and pigs delivered are required.
- As a basis for calculating the statistical samples for the surveys of farms in aquaculture, the annual production quantity and trade volume in tons would be suitable for dividing farms into categories. These data must be made accessible for future national animal welfare monitoring.
- For the statistical sampling of slaughterhouses and abattoirs, information on the slaughtered animal species, their production purpose and slaughter quantities is neccessary.
- For the statistical sampling of the control posts, information on the animal species (and production purpose) and the number of animals housed there is required.

5 Implement the collection of missing data

For the majority of relevant animal welfare indicators, data are not yet available. They would have to be collected for the implementation of animal welfare monitoring.

With regard to the future data collection, a distinction can be made between information that:

- Can be collected by means of written surveys (self-disclosure).
- Must be collected through external auditors on farms, at slaughterhouses etc.

The collection of data is associated with costs and effort for the commissioned institutions and for the participating enterprises. We therefore recommend that the surveys are not conducted for all terrestrial farms, aquaculture farms, control posts, collection centres and slaughterhouses, but for a representative sample thereof.

Sampling for future national animal welfare monitoring can be based on the tried and tested procedures of existing official statistics (e.g. livestock surveys for pigs and sheep, agricultural census, agricultural structure survey). The population (i.e. the sum of all relevant enterprises) is segregated into strata (i.e. subtotals) according to federal state and size class of the enterprise. The relative standard error, which is calculated for the livestock numbers, serves as a measure of accuracy of the results.[32]

An initial estimate of possible sample sizes for the audits was made on the basis of past statistical surveys (agricultural census, livestock survey) in order to obtain an estimate of the scope of a national animal welfare monitoring survey. The procedure is explained in more detail in section 5.2.

[32] Federal Statistical Office (2022): Qualitätsbericht der Viehbestandserhebung Schweine, Ziffern 3.1 und 4.2 (Quality report on the 2022 pig livestock survey, sections 3.1 and 4.2); https://www.destatis.de/DE/Methoden/Qualitaet/Qualitaetsberichte/Land-Forstwirtschaft-Fischerei/viehbestand-schweine.html.

In addition, we recommend the collection of further data for the description of framework conditions of animal husbandry (context-indicators). This includes information on the enforcement of animal welfare legislation (inspected farms and penalised violations), the public's attitude towards animal welfare, the share of products with animal welfare labels and animal welfare support measures.

5.1 Written survey of animal welfare indicators

Management- and resource-based indicators for which no data is available can be collected in a written survey. These indicators can be divided into the following groups:

- Husbandry methods (including mother-bonded rearing of young animals): e.g. access to outdoor area, pasture and housing systems with a winter garden.
- Stable structuring: e.g. functional areas, floor conditions, coat care facilities, lambing areas, weather protection, lamb creeps, pens for sick animals.
- Animal care: e.g. amount and type of feed and colostrum supply for young animals, water and feed supply.
- Interventions on the animal: e.g. teeth trimming, tail docking, dehorning, castration, beak trimming.
- Farm management: e.g. participation in continued and advanced training, use of milk components for ration ingredient composition, extended and continuous milking, animal losses, rearing losses, stillbirth rate, parasite management, hoof or claw care, fixation time in the farrowing area, sheep shearing, drying off.
- Transport and slaughter: e.g. exemptions for halal slaughter, transport and stabling times, group composition, video recordings, feed supply and flooring in control posts and collection centres.

We recommend that the statistical offices implement the written survey of animal welfare indicators.[33] The additional questions could either be integrated into existing surveys or recorded as part of a separate animal welfare survey.

[33] Before new animal welfare–relevant items are included in the surveys of official agricultural statistics, the Federal Statistical Office is obliged under Section 5a of the Federal Statistics Act to check existing administrative data for their suitability for future national monitoring. This also applies in the event that new surveys are ordered.

Because of the relatively short list of items in the existing livestock surveys for pigs and sheep, the additional questions for a national animal welfare monitoring system could be integrated into these surveys. This would mean that the current sampling plan of these surveys would also apply to the animal welfare monitoring survey for pigs and sheep. It is also possible to integrate animal welfare questions into the laying hen survey.[34] For the other animal species, no primary statistical livestock surveys exist. The agricultural census or agricultural structure survey, in which the husbandry methods are already recorded, is not considered suitable for the integration of a set of additional animal welfare questions because the survey programme is already extensive. Therefore, separate surveys would have to be designed for cattle, broilers and goats.

The same applies to the written surveys of slaughterhouses, control posts and collection centres. A written survey is not recommended for aquaculture; here the relevant resource- and management-based indicators can be collected in a query as part of the audits.

In general, the written animal welfare survey should be a representative sample survey, the exact scope of which would depend on the data quality requirements.

5.2 Audit survey

For the implementation of national animal welfare monitoring, indicators that cannot be recorded reliably as part of a written survey need to be collected by means of audits. In many cases, these are animal-based indicators, but some are also resource- and management-based indicators that proved to be too complex for a written survey during the project's trial surveys or for which a low response quality is expected in a written survey.

Examples of animal-based indicators include lameness in cattle, pigs, sheep and goats, fin damage in rainbow trout and common carp, or the effectiveness of stunning during slaughter. Resource- and management-based indicators recommended for the audits are, for example, suitable housing material for pigs or an adequate water supply for terrestrial animals.

[34] However, owing to the cut-off limits for this survey for enterprises with fewer than 3,000 hen places, this approach would not allow any statements to be made about husbandry methods such as mobile sheds, which are common on farms with smaller flocks.

Who should conduct the audits?

In Germany, audits are conducted as part of various initiatives and certifications. In addition to audits to check compliance with organic farming standards, these include QS audits and audits for animal welfare labels. The certification inspection bodies have expertise with various animal species and in many cases knowledge in the collection of animal welfare indicators. This infrastructure should be used for the implementation of the future monitoring. This will not only allow existing know-how and organisational structures to be used but may also avoid multiple visits to farms where similar information is collected.

Which qualifications do the auditors need to have?

The animal welfare audits require extensive species-specific knowledge and skills. Training as a farmer or fish farmer, a degree in agricultural sciences or veterinary medicine are good prerequisites for conducting audits for future monitoring. The most important requirements that auditors must fulfil are:

- The ability to reliably record the specified animal welfare indicators.
- Experience in dealing with animals, the respective animal species and the people on the farms.
- Experience with operational processes, husbandry systems and production structures.

In terms of experience, auditors should have three years of professional experience and at least one year of experience with the species to be audited. For the auditing of aquaculture farms with common carp or rainbow trout, for instance, it is therefore not sufficient to have many years of experience with audits on laying hen farms.

Specific training (online and face-to-face) is required to ensure a reliable collection of animal welfare data. This training can, for example, be provided by chambers of agriculture, scientists, consultants or veterinarians. Persons who are interested in auditing for future monitoring must complete training courses for the animal species for which they conduct the audits. The training courses should conclude with a review of the reliability of the survey, assessed in an online and an on-site test.

The training courses and tests need to be repeated regularly to maintain the quality of the audits. The trainers should also regularly be trained by a panel of experts (‘train the trainer’).

How do participating farms and enterprises benefit?

We recommend that the results of the animal welfare indicators recorded be made available to the auditees. This gives the terrestrial farms, aquaculture farms and enterprises (control posts, collection centres and slaughterhouses) participating in the audits the opportunity to compare their own animal welfare situation with that of the population of farms and companies audited for national animal welfare monitoring.

On what number of farms and enterprises should the audits be conducted?

The Federal Statistical Office conducted test calculations for the animal species pigs and sheep based on existing sampling concepts in order to estimate how many farms would have to be audited for future animal welfare monitoring. For this exercise, the cut-off limits of the official statistics were taken into account, i.e. farms only take part in the survey if they keep more than 10 breeding sows or 50 pigs or more than 20 sheep. According to the results, the sample for the audits should comprise around 1,300 pig farms and around 800 sheep farms (see Table 2). This sample size corresponds to about 6% of the pig farms included in the 2020 agricultural census and about 8% of the sheep farms. In the test calculations, applying this sample size to the farms surveyed in the audits, the variables ‘total pigs’ and ‘total sheep’ could be determined with a relative standard error of 7 % at federal and state level. This is a comparatively high standard error for results published in the official agricultural statistics.[35]

[35] The standard error for the variables ‘total pigs’ was less than 2% in the November 2022 pig livestock survey, in which significantly more farms were surveyed (around 7,900).

No sample from existing official agricultural statistics can be used to calculate the sample sizes for the audits for the other animal species (cattle, goats, chickens and turkeys, rainbow trout and common carp) or for audits for transport, slaughter and rendering. Because the new recalculation of sampling plans is time consuming, it was not done for these species and areas in the framework of the NaTiMon project.
To determine the sample sizes for common carp and rainbow trout, it would additionally be necessary to change the existing maintenance procedures for the data of the basic population of pond farmers in the statistical network.

To have a point of reference for further questions related to the audits (cost estimate, survey frequency), a selection rate of 10 % of the farms and enterprises was assumed. For the audits in the future monitoring, the samples will need to be recalculated for each survey period because sampling plans may quickly lose validity owing to the structural change in agriculture and food processing (which can lead to a sharp decline in farm and enterprise numbers).

Table 2: Estimate of possible sample sizes for national animal welfare monitoring

		Number of enterprises	Sample	
			Number of enterprises	Percentage of enterprise (%)
Farms with	cattle[1]	95,100	9,510	10
	pigs[1]	**21,300**	**1,300**	**6**
	sheep[1]	**10,300**	**800**	**8**
	goats[1]	1,400	140	10
	laying hens[1]	2,800	280	10
	broilers[1]	1,700	170	10
	turkeys[1]	800	80	10
Aquaculture	rainbow trout[2]	870	87	10
farms with	common carp[2]	1,500	150	10
Control posts and collection centres for	cattle[3]	259	25	10
	pigs[3]	131	13	10
	sheep and goats	unknown	unknown	unknown
Slaughterhouses for	cattle, pigs, poultry[4]	7,100	710	10
	sheep and goats	unknown	unknown	unknown

[1] Calculations for the NaTiMon project based on data from the 2020 agricultural census, taking into account farms with 10 cattle, 10 breeding sows, 50 pigs, 20 sheep, 20 goats or more than 1,000 places for poultry, figures rounded.
[2] Data from aquaculture statistics: Federal Statistical Office (2020): Genesis Online, farms with aquaculture production, quantity produced: Germany, years, fish species (result 41362-0003).
[3] Establishments for the collection of animals. List of approved holdings for the collection of ungulates from which animals are moved to another Member State or which receive animals from another Member State (in accordance with Article 97 in conjunction with Article 94 (1) (a) of Regulation (EU) 2016/429) of the Federal Ministry of Food and Agriculture (2022).
[4] Federal Office of Consumer Protection and Food Safety (2023): https://apps2.bvl.bund.de/bltu/app/process/bvl-btl_p_veroeffentlichung?execution=e1s2.

The sample sizes for rendering plants are not listed in Table 2 because sample size calculation for these audits has to follow a different rationale. The reference value for the indicators collected at rendering plants is not the number of rendering plants but the total number of dead, euthanised or emergency-killed animals delivered to the rendering plants. This number is not known and needs to be identified at the rendering plant for the calculation of a representative sample size.

How often should the audits be conducted?

Although one result of the online survey was that the majority of respondents would like to see animal welfare reporting on an annual basis, a wider frequency is recommended. Annual reports would require annual indicator surveys (option 1) and data analysis, which would entail a great deal of effort and therefore high costs. It is estimated that around 80 to 100 full-time employees would be required to audit a representative number of enterprises each year. The costs for the audits in option 1 would amount to around 6.5 million euros per year. It can also be assumed that many animal welfare indicators do not change significantly from year to year, meaning that annual reporting for these indicators would not result in any substantial gain in information.

A more cost-effective option would be to conduct the surveys of animal welfare indicators every four years (option 2). However, it does not seem practicable to qualify a large number of auditors and deploy them for animal welfare monitoring only every four years.

Another way to reduce costs would be to split the survey sample (in this case 13,000 farms and enterprises) over four years and to conduct 3,250 audits each year (option 3). However, the problem here is that structural change can lead to major changes in the total numbers of farms and enterprises during this period, meaning that the sample calculated for the first year of the survey is no longer valid by the third year at the latest. In addition, the conditions for animal husbandry can change significantly over the four years (e.g. with regard to epidemics, legislation, management methods), so that the comparability and the interpretability of the data would be severely limited.

An alternative to these three survey frequencies is option 4, in which a sample is taken for each production purpose over two years and a different production purpose of the same animal species in the next two years (see Figure 7). In group A, for example, surveys would be conducted over a period of two years on farms with beef cattle, fattening pigs, broilers, sheep, and rainbow trout, at slaughterhouses, control posts and collection centres for cattle, sheep and goats, and at part of the rendering plants.

In the following two years, group B would be surveyed: farms with dairy cows and calves, sows and weaners, laying hens, goats, and common carp, slaughterhouses for pigs and poultry, control posts and collection centres for pigs, and the second part of the rendering plants. The advantage of this division is that it allows forming groups of approximately the same size and that the auditors can be permanently deployed in the animal species or related animal species for which they have the appropriate qualifications. The animal welfare monitoring reports for the animal species in groups A and B would follow one year after completion of the surveys to enable data processing.

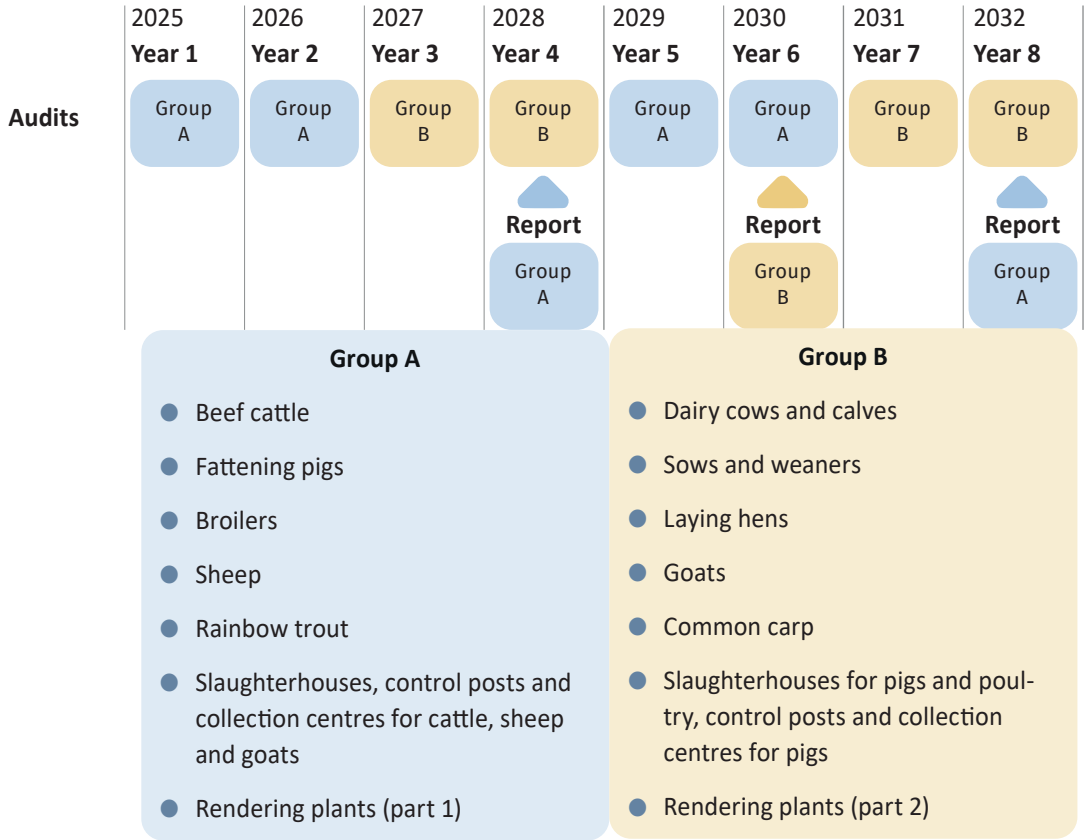

Figure 7: Option 4 – Breakdown of the audit and reporting schedule by production purpose or animal species

Publication should take place after the completion of the report for each production system or animal species so that the period between the survey and publication is not too long. This would lead to a report which covers half of the animal species or production purposes being published every two years. This approach is recommended for the implementation of national animal welfare monitoring for reasons of practicability and cost.

5.3 Conduct further surveys

In addition to the indicators that are recorded on terrestrial farms, aquaculture farms, at control posts and collection centres, in slaughterhouses and at rendering plants, other indicators and data sources which describe the framework conditions in which animal husbandry takes place are also important for future monitoring (see context-indicators in the appendix):

- The society's attitude towards animal welfare should be recorded in a survey conducted every four years.
- To calculate the proportion of animal products with animal welfare labels, information on the number of farms with certification and the corresponding production volumes is needed. This can either be provided by the label providers (e.g. Neuland, Deutscher Tierschutzbund) or could be collected via a survey in slaughterhouses and dairies.
- Information on animal welfare–related agricultural support measures, such as the agricultural investment support programme, animal welfare premiums and educational and advisory measures, is published annually by the federal states. The data need to be made available in such way that information of the subsidised farms and animals can be analysed.

6 Publish an animal welfare monitoring report

To inform all interested groups about the status quo and the development of animal welfare, the results of the national animal welfare monitoring should be published in the form of reports and on a website.

Based on the proposed animal welfare indicators, the development of the animal welfare situation should be reported regularly so that all interested groups can be informed. We recommend that this be done in the form of reports (print, PDF for download) and on a website.

In order not to overload readers with information, a selection of the recommended indicators should be presented in the respective monitoring reports (print, PDF for download). The relevance of the indicators may change over time, e.g. indicators associated with heat stress may be of secondary importance at present but may become more important as a result of climate change. To consider the changing significance of the indicators and shifts in societal interests, we recommend that a committee be set up which is responsible for selecting indicators for reporting. This committee should include representatives from all social groups (see step 2 'external committees', p. 29).

Appendix:
List of recommended indicators

	Cattle	Pig	Sheep, Goat	Poultry
Health/disease/treatment				
Mortality rate	x	x	x	x
Productive lifespan/longevity	x			
Non-curative interventions on animals (amputations)	x	x	x	x
Claw care and condition	x	x	x	
Lameness	x		x	
Cleanliness (also anogenital region)	x		x	
Body condition score	x	x	x	x
Condition of skin, fleece and plumage (integument alterations)	x	x	x	x
Tail and ear lesions	x	x		
Foot pad dermatitis and hock burns				x
Nasal and ocular discharge	x		x	
Keel bone damage				x
Obviously sick animal	x			
Apathy/runt		x	x	
Dead/emergency-killed animals with swellings	x	x		
Umbilical and testicular hernias		x		
Getting-up behaviour	x			
Stereotypies		x		
Metabolic health (fat–protein ratio of milk)	x		x	
Pre- and post-slaughter findings (diseases and lesions) caused by on-farm factors	x	x	x	x
Incidence of treatments	x	x		x
Parasite management			x	
Live weight and uniformity			x	

Health/disease/treatment	Cattle	Pig	Sheep, Goat	Poultry
Separation of sick animals			x	
Emergency killing	x	x		
Signs of delayed euthanasia	x	x		
Udder health	x		x	
Dry cow treatments (with/without antibiotics)	x			
Extended and continuous milking			x	

Housing and stable equipment	Cattle	Pig	Sheep, Goat	Poultry
Housing systems and husbandry methods	x	x	x	x
Space availability/stocking density and structural elements	x		x	x
Pasture and outdoor access	x		x	x
Lighting				x
Animal-to-cubicle ratio	x			
Grooming equipment (brushes)	x		x	
Bedding management and quality (including lying areas)	x		x	
Environmental enrichment		x		x

Feed and feeding	Cattle	Pig	Sheep, Goat	Poultry
Water supply	x	x	x	
Animal-to-feeding-place ratio/feeding facilities	x		x	
Roughage supply	x			

Young animals and birth	Cattle	Pig	Sheep, Goat	Poultry
Milk feeding, quantity and feeding management	x			
Colostrum supply			x	
Stillbirth rate and birth records			x	
Cow-bonded calf rearing	x			
Weaning age			x	
Lambing area			x	
Fixation period in farrowing area		x		

Transport and slaughter	Cattle	Pig	Sheep, Goat	Poultry
Animals dead on arrival	x	x	x	x
Unloading (animal handling, slipping and falling, lameness)	x	x	x	
Transport and waiting time	x	x	x	x
Loading density	x	x		x
Water supply during transport	x	x	x	
Bedding during transport	x	x	x	
Floor condition at control posts, collection centres and in the slaughterhouse	x	x	x	
Feed and water supply at control posts, collection centres and in the waiting pens at the slaughterhouse	x	x	x	
Apathy at control posts, collection centres and in the slaughterhouse			x	
Space availability at control posts, collection centres and in waiting pens at the slaughterhouse	x	x	x	
Third country exports	x			
Group composition			x	
Noise level	x	x		x

Transport and slaughter	Cattle	Pig	Sheep, Goat	Poultry
Skin injuries and freshly bleeding wounds	x		x	
Haematomas and broken/luxated wings and/or legs				x

Slaughter	Cattle	Pig	Sheep, Goat	Poultry
Separate/preponed slaughter	x	x	x	
Findings or suspected findings of the ante-mortem inspection that result in a ban on slaughtering	x	x	x	
Bleeding in the skin, muscles and tissue as well as fractures	x	x	x	
Animals not slaughtered for other reasons	x	x		
Animal handling and use of electric prods in the drive/ animal handling, flapping and pre-stun shocks during waterbath stunning	x	x	x	x
Incomplete/missing neck cut and manual recutting				x
Stunning effectiveness	x	x	x	x

Rainbow trout and common carp	Rainbow trout	Common carp
Training level of the person in charge	x	x
Predators	x	x
Pests	x	x
Predator and pest management	x	x
Precautions to ensure adequate oxygen supply	x	
Water quality measuring instruments	x	x
Hygiene concept and biosecurity	x	x
Occurrence of dead fish in the stock	x	
Occurrence of abnormal fish	x	
Swimming behaviour	x	
Live fish transport (out of the farm)	x	x
Live fish transport (into the farm)	x	x
Time exposed to air in the course of stunning and killing	x	x
Success of stunning	x	x
Time between stunning and killing	x	x
Reflexes at the time of killing	x	x
Eye cloudy, cataract	x	
Eye rupture and loss	x	x
Morphological changes of opercula	x	x
Injury of operculum soft tissue		x
Changes to the upper jaw	x	x
Changes to the lower jaw	x	x
Skin lesions without tissue loss	x	
Skin lesions with tissue loss	x	x
Scale loss with relevance to animal welfare		x
Pressure sores		x
Spinal deformities	x	
Fin status (pectoral, dorsal, caudal)	x	x

Context-indicators
Attitudes of the population towards animal welfare
Consumer choice for products with animal welfare and organic labels
Farms with animal welfare and organic certification
Qualification, (continuing) education, training on animal welfare
Public funding for animal welfare support measures
Number of animals in animal welfare support measures
Animal welfare inspections on farms
Prosecution and penalisation of violations of animal welfare legislation

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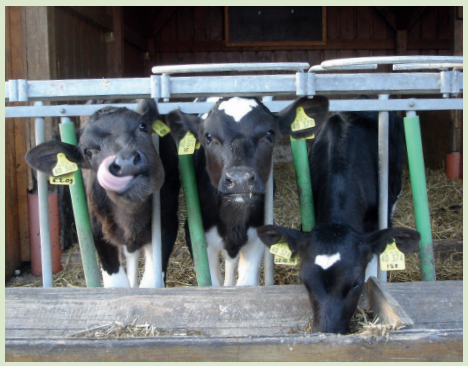

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