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# Guideline on the reporting of antimicrobial sales and use in animals at the EU level – denominators and indicators

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# Executive summary

This document provides guidance on the reporting of antimicrobial sales and use in animals at the EU level under Regulation (EU) 2019/6 [1] and the related delegated and implementing acts [2, 3]. This document should be read in conjunction with the 'Antimicrobial use data reporting per animal categories (numerator) - Manual for reporting the data to the Agency' [4].

The purpose of this guideline is to describe the methodology for calculating denominators and indicators to be used by the European Medicines Agency (Agency) for reporting antimicrobial sales and use data and to inform Member States[1]. In particular, the document outlines the animal population data that should be reported by Member States and the necessary adjustments, according to so-called denominators, to be made by the Agency for the calculation of population-adjusted volume of sales and of the use of antimicrobials; this will facilitate subsequent validation by Member States.

The methodology outlined in this document will ensure that the data analyses necessary for the preparation and publication of the Agency's reports on the volume of sales and on the use of antimicrobial medicinal products in animals is standardised.

This guideline was developed by the Agency in collaboration with the European Surveillance of Veterinary Antimicrobial Consumption (ESVAC) Denominators and Indicators *ad hoc* review group (ESVAC *ad hoc* group). Experts from Eurostat were consulted during the preparation of the guideline, representatives from the European Commission were invited to the discussions as observers and Member States were consulted via an EU Survey on availability of animal population data for certain animal species, categories and stages.

This guidance document may be subjected to revision pursuant to changes in the applicable legal provisions and on the basis of experience gained through the application of this guidance, as needed.

# 1. Introduction

Article 57 of the Regulation (EU) 2019/6 requires Member States to collect data on the volume of sales and on the use of antimicrobial medicinal products used in animals and send collated data to the Agency, to enable in particular the direct or indirect evaluation of the use of such products in food-producing animals at farm level. The Agency will cooperate with Member States and other Union agencies to analyse those data and publish annual reports. It is required that the Agency takes into account those data when adopting any relevant guidelines and recommendations.

The advice provided by the Agency on implementing measures under Article 57(3) of the Regulation (EU) 2019/6 on veterinary medicinal products – 'Report on specific requirements for the collection on antimicrobial medicinal products used in animals' [5] - recommends conducting a scientific assessment on different denominators and indicators for reporting of the use data.

The key objectives of the antimicrobial data collection at the EU level, as per recital (50) of Regulation (EU) 2019/6 are as follows:

- Document detailed and comparable data on the volume of sales and the use of antimicrobials in animals.

- Determine the trends in the volume of sales and in the use of antimicrobials in animals over time.

- Identify possible risk factors to the public and animal health related to the development of antimicrobial resistance resulting from the use of antimicrobials in animals.

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[1] For the purpose of this document, Member States are the 29 EU/EEA countries.

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- Assist the development of measures to limit the risk from antimicrobial resistance and monitor the effectiveness of measures already introduced.

- Support integrated analysis on antimicrobial use and antimicrobial resistance in the human- and animal sectors.

# 2. Scope

This guideline describes the animal population statistics, denominators and indicators, including the methodology for calculating the denominators and indicators, that will be used for the reporting of antimicrobial sales and antimicrobial use per animal species, categories and stages at national and EU/EEA level for those antimicrobials that fall under the scope of Articles 1 and 3 (mandatory reporting) of Commission Delegated Regulation (EU) 2021/578. The Agency will report separately from the above data when data on the volume of sales or on use are provided by Member States in accordance with Articles 2 and 4 (voluntary reporting) of that Delegated Regulation.

# 3. Legal basis

This guideline has to be read in conjunction with Regulation (EU) 2019/6 [1], Commission Delegated Regulation (EU) 2021/578 [2] and Commission Implementing Regulation (EU) 2022/209 [3].

Article 57 of Regulation (EU) 2019/6 requires Member States to collect relevant and comparable data on the volume of sales of antimicrobial veterinary medicinal products (VMPs) and on the use of antimicrobial medicinal products used in animals to enable the direct or indirect evaluation of the use of such products in food-producing animals at farm level. Commission Delegated Regulation (EU) 2021/578 sets out the requirements and timelines for reporting of both data on the volume of sales of antimicrobial VMPs and on use of antimicrobial medicinal products used in animals. Those data should cover, respectively, at least the antimicrobials listed in points 1 and 3 of the Annex. Article 15 of the Delegated Regulation provides for a progressive stepwise approach regarding the animal species, categories and stages for which data on the use of antimicrobial medicinal products is to be collected.

In accordance with Commission Implementing Regulation (EU) 2022/209, the format to be used by Member States to send collated data on the volume of sales of antimicrobial VMPs and on the use of antimicrobial medicinal products in animals to the Agency should include the number of packages for each product presentation (name, product form, strength and pack size) sold or used within the reporting year per Member State. The Agency will use these data in standardised calculations to obtain weight of active substance sold or used per animal species, categories and stages.

Article 16(4) of Commission Delegated Regulation (EU) 2021/578 requires the Agency to analyse the data on the volume of sales of antimicrobial VMPs and on the use of antimicrobial medicinal products, and identify trends and pattern changes over time, both at national and EU levels. In accordance with Article 16(1), in its reports the Agency should include the data on the volume of sales of antimicrobial VMPs and on the use of antimicrobial medicinal products per animal species, as referred to in Articles 12(2) and 13(2).

To ensure comparability of the reported data and to allow monitoring of trends – both on the volume of sales of antimicrobial VMPs and on the use of antimicrobial medicinal products in animals – it is necessary to evaluate these data in the context of the associated animal populations, which vary in size and composition over time and across Member States. Pursuant to Article 16(5) of Commission Delegated Regulation (EU) 2021/578, the relevant animal populations must be identified – via publicly accessible EU databases. In the event that the necessary data on relevant animal populations is not available in such EU databases, or that those data would not comply with the data quality

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requirements laid down in Article 6 of Commission Delegated Regulation (EU) 2021/578, the Agency is to require Member States to provide or amend such data via the Agency's web interface.

Pursuant to Article 16(6) of Commission Delegated Regulation (EU) 2021/578, for the reporting on the volume of sales of antimicrobial VMPs, the Agency must report the data for the corresponding animal populations likely to be treated with these products in the reporting Member States. The data should be analysed separately for food-producing animals and for other animals kept or bred[2], in accordance with the format of the data to be collected and reported laid down in Commission Implementing Regulation (EU) 2022/209.

Data on the use of antimicrobial medicinal products must be reported for the animal species, categories or stages as set out in Article 15 of Commission Delegated Regulation (EU) 2021/578.

As stated in recital (7) of Commission Implementing Regulation (EU) 2022/209, to ensure that the data collected on the sales and the use of antimicrobials is comparable year-over-year within Member States and at EU level, the format for reporting of the data should take into account the size of the animal population that is likely to be treated with antimicrobials. This should also facilitate comparisons of data reported at national and EU level with data available from non-EU countries and at global level.

Points (a) and (b) of Article 4(1) of Commission Implementing Regulation (EU) 2022/209 define the format for the animal population data as the number of animals per year (living animals or slaughtered animals, depending on the animal species or categories concerned) with regards to terrestrial animals and the biomass produced per year for farmed fish (live weight at slaughter), respectively. Moreover, Article 4(2) of Commission Implementing Regulation (EU) 2022/209 requires that animal population data must be corrected with the number of animals brought in from or sent to other Member States for fattening or slaughter, for the relevant animal species, categories and stages thereof. For analysis purposes, in accordance with Article 5, the Agency must adjust the data for the relevant animal populations according to so-called denominators, which should be calculated on the basis of a combination of the number of animals slaughtered during the data collection period and of the number of live animals present in a Member State at a given point in the data collection period, multiplied by standardised animal weights.

Commission Delegated Regulation (EU) 2021/578 and Commission Implementing Regulation (EU) 2022/209 do not specify which indicators – as measurements of exposure to antimicrobials – should be used for the reporting of data on the volume of sales of antimicrobial VMPs and on the use of antimicrobial medicinal products used in animals. Therefore, the assessment of the indicators is based on information about which indicators are currently used for reporting surveillance data of antimicrobial sales and use at regional and global level as well as in human medicine (see Section 6).

# 4. Sales data and use data per animal species, categories and stages

Data on the volume of veterinary antimicrobials sold and of antimicrobials used per animal species, categories and stages must be reported by Member States to the Agency as numerical values indicating the number of packages of product presentation sold or used within the reporting year in the reporting Member State in accordance with Annex I and II of Commission Implementing Regulation (EU) 2022/209[3] [6, 7]. The Agency will calculate the amounts sold or used per antimicrobial substance expressed in mg which will be used as basis for the numerator part of the indicators (see Section 6).

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[2] Dogs, cats, minks and foxes are the four non-food-producing animal species for which use must be reported as per Article 15(3) of Commission Delegated Regulation (EU) 2021/578.
[3] Detailed instructions for Member States on the reporting of antimicrobial sales and use data can be found in the Agency's protocols [6, 7].

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The veterinary antimicrobial medicinal products for which data on the volume of sales must and may be collected and reported to the Agency, are detailed in the Annex to Commission Delegated Regulation (EU) 2021/578. This is also the case for the antimicrobial medicinal products for which data on use in animals must or may be collected and reported to the Agency. Further instructions on how to report such use in accordance with the legislative requirements are detailed in the Agency's manual for reporting antimicrobial use data [4].

# 5. Assessment of denominators

In the context of this document, the denominator is a proxy for the animal population likely to be treated with antimicrobials within a reporting year, expressed as animal biomass (kg) per year and calculated based on a combination of the number of animals slaughtered and of the number of live animals present in a Member State during the data collection period, multiplied by standardised animal weights.

The methodology for calculation of the ESVAC denominator (known as population correction unit, PCU) has been in place for several years for reporting the sales of antimicrobial VMPs [8, 9]. However, it is important to note that some animal categories are not accounted for in the PCU. For instance, due to the non-availability of the data held by Eurostat on the number of live goats when the PCU methodology was first established, this category was not included in the PCU calculation. As a result, countries with a large goat population have an underestimate of their total PCU. ESVAC participating countries have indicated the need to revise this denominator, i.e. animal categories to be included and weights of animals used for calculation of the sales PCU, as recommended in EMA's concept paper on the reporting of antimicrobial sales and use in animals at the EU level [10].To guarantee fulfilment of the requirements and obligations set by Article 57 of Regulation (EU) 2019/6 and related legislative delegated and implementing acts (referenced above), the ESVAC *ad hoc* group together with the Agency reviewed the ESVAC denominator (PCU) as a basis for the revision of the sales denominator and for the assessment of the denominators for reporting use data by animal species, animal categories and stages. This revision also includes the standard weights used by ESVAC for calculation of the animal biomass (PCU). The revised methodology will provide the denominators for the Agency to analyse data on the volume of sales and on the use of antimicrobial medicinal products in animals and publish an annual report, as mandated in the Article 57 of Regulation (EU) 2019/6.

The assessment presented in this document also takes into consideration the results of an EU Survey prepared by the Agency and the ESVAC *ad hoc* group, to investigate the availability of animal population data for relevant animal species, categories and stages at national level which are currently not available in EU databases (Annex 3). Moreover, the assessment also takes into account how sales and use of antimicrobial agents in the animal sector are reported at global level, and published methodologies for reporting sales and use by non-EU countries as well as relevant recent publications.

When assessing which should be the relevant animal populations to be included in the calculation of the denominators, the Agency considered the animal species, categories and stages thereof for which data on the use of antimicrobial medicinal products must be collected and reported as listed in Article 15 of Commission Delegated Regulation (EU) 2021/578 in conjunction with the Agency's instructions for reporting the antimicrobial use per animal categories [4].

VMPs are typically authorised for more than one species and, thus, it is not possible to report sales of antimicrobial VMPs per species. In principle, all food-producing animals and other animals kept or bred may potentially be treated with antimicrobial VMPs. Therefore, the denominator that will be used to report the sales data should be the aggregated denominator for the animal species, categories and

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stages for which antimicrobial use data have to be reported as per Article 15 of Commission Delegated Regulation (EU) 2021/578.

The stability of parameters and principles for calculating the denominator should be ensured to follow historical trends. Thus, future revisions of the denominator parameters and principles should be done with caution. For instance, the availability of historical data should be ensured when considering additional animal categories or stages, to avoid disrupting or distorting the evaluation of trends.

## 5.1. Animal populations: data sources and reporting timelines

When assessing the data sources for relevant animal species, their categories and stages thereof, the criteria below were followed:

1. The collected data should be harmonised between countries.

2. The methodology for collecting and reporting animal population data should be transparent.

3. The data should be validated at regular intervals.

4. When the necessary data on relevant animal populations are not available in relevant EU databases, national statistics should be provided. Such data must be collected by or be accessible to the respective national competent authorities.

The European Statistical Office, Eurostat, publishes validated statistics on numbers of livestock and slaughtered food-producing animals, and these data comply with the first three criteria mentioned above (national statistical authorities transmit data to Eurostat in compliance with common EU statistical regulations and standards and Eurostat carries out data validation and quality control checks). **Therefore, Eurostat was selected as the main data source for food-producing animal population statistics**. For certain animal species, such as rabbits, geese, horses and farmed fish, dogs, cats, minks and foxes, data are not available in Eurostat, and national statistics, when available, should be used.

The EU statistics on meat production, livestock and aquaculture can be accessed in Eurostat's publicly available database:

- Slaughtering in slaughterhouses – annual data: (apro_mt_pann).

- Livestock bovine population – annual data (apro_mt_lscatl).

- Livestock goats population – annual data (apro_mt_lsgoat).

- Livestock sheep population – annual data (apro_mt_lssheep).

- Livestock pig population – annual data (apro_mt_lspig).

- Production from aquaculture excluding hatcheries and nurseries (from 2008 onwards) (fish_aq2a).

- Production of eggs for consumption and number of laying hens (apro_ec_egghen).

In accordance with Article 4(3) of Commission Implementing Regulation (EU) 2022/209, when Member States report the required animal populations for which the data are not available in Eurostat, they are to submit to the Agency a detailed description of the methodologies used to generate the relevant animal population data.

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The volume of antimicrobial VMP sales and antimicrobial use in animals in a country is also linked to numbers of animals traded between Member States for fattening or slaughter[4]. As the numbers of animals moved between the EU countries are based on health certificates, an obligatory requirement for all animals passing any border, intra-EU animal trade data will be obtained from the Trade control and Expert System (TRACES)[5].

The first report covering 2023 data should be published by 31 March 2025 while from 2025 the reports should be published annually by 31 December[6], hence it is necessary to clarify the timelines for submission of the animal population data. Data submission, in the context of this document, is the action of yearly reporting the data to the Agency, via the respective web interface, after data are validated by Member State using the Power BI tools that will be made available to the Member State by the Agency. Therefore, **the same data submission deadlines as per Article 17 of Commission Delegated Regulation (EU) 2021/578 apply for the submission of animal population data,** so that the required data and analyses, as per Article 16, can be included in the Agency's reports. Since the same animal population data will be used to calculate the denominators for the volume of sales of antimicrobial VMPs and for the use of antimicrobial medicinal products in animals, Member States must submit animal population data for 2023 to the Agency by 30 June 2024.

The Agency will minimise the resources required by Member States to enter animal population data in the web interface by pre-filling data entry fields for each new reporting year using data available from Eurostat and TRACES. If data are not available when extracted by the Agency for Member States validation[7] [11-13], it is recommended to Member States to submit provisional statistics or data from the preceding calendar year. Once the data become available, it is the responsibility of Member States to report the correct animal population data to the Agency.

## 5.2. Methodology for calculating the denominator (animal biomass)

The overall aim is to obtain a harmonised denominator that represents – to the extent possible - the total biomass of animals that could have been treated with antimicrobials in a year in each Member State. For the calculation of the denominator for food-producing animals, standard weights for each animal species, category and stage will be used, as appropriate. As animal weight varies by age, production stage and type, the population demographics of the various animal species must be considered. Whenever possible, the following criteria were applied:

- For animals living more than 1 year, livestock statistics will be used as they are considered to be a good basis to evaluate the number of animals present in the Member States during the year of analysis.

- For animals living less than 1 year, annual meat production (slaughter) statistics will be used.

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[4] Animals are more likely to be treated with antimicrobials in the country of origin. However, the number of animals is included in the Eurostat data for the destination country, e.g. as number of animals slaughtered and biomass slaughtered (carcass weight). Eurostat reports data of the number of traded animals for fattening or slaughter only above a certain threshold.
[5] TRACES is the European Commission's online platform for sanitary and phytosanitary certification required for the importation of animals, animal products, food and feed of non-animal origin and plants into the European Union, and the intra-EU trade and EU exports of animals and certain animal products.
[6] In accordance with Article 17 of Delegated Regulation (EU) 2021/578, for the first annual report covering data from 2023, the volume of sales of antimicrobial VMPs should be submitted by Member States by 30 June 2024 and the use of antimicrobial medicinal products for the relevant species, categories or stages by 30 September 2024. From 2025 onwards, submission of volume of sales of antimicrobial VMPs data and use of antimicrobial medicinal products use data by Member States must take place by 30 June of each year, covering data from the preceding calendar year.
[7] Member States data transmission frequency requirements to Eurostat concerning terrestrial animal production statistics are stated in Regulation (EC) No 1165/2008, to be repleal from 1 January 2025 by Regulation (EU) 2022/2379, and concerning aquaculture statistics are specified in Regulation (EC) No 762/2008. Transmission of animal statistics to Eurostat varies per animal species and animal category, some requiring biannual updates while others only once a year. Slaughter data in slaughterhouses is updated monthly which can counter this seasonality.

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- The animal biomass (in kg) will be obtained by multiplying the number of animals (from livestock and slaughter statistics) by the standard weight of the animal species, category or stage in question.

- The biomass of animals brought in from another Member State for fattening or slaughter should be subtracted from the respective domestic animal biomass. The biomass of animals sent to another Member State for fattening or slaughter should be added to the respective domestic animal species or category biomass in the country of origin[8].

The ESVAC *ad hoc* review group also considered adjusting the biomass of animals likely to be treated with antimicrobials with the animal's lifespan, as suggested by Radke, B. R. [14] and Sanders et al. [15]. Currently, EU standardised average lifespan values are not established for the animal species and categories listed in Article 15 of Commission Delegated Regulation (EU) 2021/578. To establish such standards, a protocol for collecting harmonised and standardised data would have to be created, data would have to be collected from a representative number of Member States and subsequently analysed. Husbandry systems, production characteristics (such as breed types, weights and lifespan), management practices also differ between species and countries. Moreover, the discrepancies in available information across countries (as assessed by the responses to the EU Survey shown in Annex 3 of the GL) pose an additional challenge to establishing lifespan correction factors that could be applied uniformly at the EU level, and the introduction of a lifespan correction factor. Moreover, in Article 5(1) of Commission Implementing Regulation 2022/209 it reads that the Agency shall adjust the data for the relevant animal populations referred to in Article 4 according to so-called denominators for analysis purposes, which should be calculated on the basis of a combination of the number of **animals slaughtered** and of the number of **live animals** present in a Member State during the data collection period, multiplied by standardised animal weights. The ESVAC *ad hoc* group concluded that the animal biomass denominator proposed in this document is robust and sufficiently detailed to enable (indirect) comparison of sales and use data at EU level with global levels[9] in line with Recital (7) of Commission Implementing Regulation 2022/209.

For food-producing animals, based on the principles and criteria described, the denominator (animal biomass) will be calculated per animal species, category and stage as follows:

**Domestic animal biomass**

- Number of animals slaughtered x standard weight (kg).

- Number of livestock[10] animals x standard weight (kg).

**IN biomass** is the animal biomass of intra-EU trade brought into the Member State (destination Member State) from another Member State (source Member State)

- Number of animals traded between countries for fattening or slaughter x standard weight (kg).

**OUT biomass** is the animal biomass of intra-EU trade sent out from the Member State (source Member State) to another Member State (destination Member State)

- Number of animals traded between countries for fattening or slaughter x standard weight (kg).

Equation 1: **Total animal biomass = Domestic biomass + OUT biomass – IN biomass**

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[8] To avoid double counting (i.e., counted both in the country of origin and destination) since these data are included in the domestic data on slaughter animals (Eurostat data).
[9] The World Organisation for Animal Health (WOAH) reports antimicrobial agents intended for use in animals at a global level and uses animal biomass as denominator to analyse the antimicrobial quantities reported. Animal biomass is calculated as the total weight of the live domestic animals in a given population present during a year in a specific area, used as a proxy to represent those likely exposed to the quantities of antimicrobial agents reported.
[10] Domesticated food-producing animals living longer than 1 year.

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Note that correction for animal biomass from animals traded between countries for slaughter or fattening will be applied at the animal category level, if applicable. The calculations of animal biomass per species, category and stage are detailed together with the description of the denominators.

For non-food-producing animal species, i.e. dogs, cats, minks and foxes, the denominator (animal biomass) will be calculated by multiplying the number of animals in the reporting year by a standard weight.

## 5.2.1. Methodology for calculating animal standard weights

As per Article 5 of Commission Implementing Regulation (EU) 2022/209, the denominators should be calculated using standardised animal weights. Several national and regional surveillance programmes developed different methodologies for determining average animal weights to use in the calculation of animal biomass. For ESVAC, standard weights at treatment have been used [9, 16]. However, estimates of live average weight at the time of treatment are not available for all the animal species, categories and stages for which data on the use of antimicrobial medicinal products must be collected and reported.

Considering the availability of data on slaughtered animals (number of heads and slaughtered biomass) at the EU level, it was decided to follow an approach similar to that of WOAH[11] [17] using estimates of live average weight for all species and categories without focusing on time at treatment[12]. Using Eurostat slaughter data (EU/EEA countries), the total slaughtered (carcass) biomass (in kg) was divided by the total number of animals (heads) slaughtered and transformed to live weight at slaughter using standard conversion factors of carcass weight[13] equivalent as defined by Eurostat[18]. Since calculated live weights at slaughter did not change more than 5% for most animal populations (slaughtered pigs, chicken, turkeys, and several cattle categories) between 2012 and 2021, **standard live weights at slaughter were calculated for food-producing animal species and categories,** whenever possible:

- using slaughter data from Eurostat for EU/EEA countries (for each animal species and categories) for 2021;

- using weighted average: the total slaughtered (carcass) biomass (in kg) divided by the total number of animals (heads) slaughtered and transformed to live weight at slaughter using standard conversion factors (from carcass to live weight)

**Standard live weights at slaughter**, hereafter referred to as standard weights, were calculated using Eurostat data according to Equation 2:

Equation 2: *Standard weight (kg)=* $\dfrac{slaughtered\ biomass\ (kg) \big/ number\ animals\ (heads)}{conversion\ factor}$

The conversion factors defined by Eurostat [18] were used to convert carcass weights into live weights at the time of slaughter.

For most food-producing animal species and categories, slaughter animal statistics (heads and slaughtered biomass) as well as the conversion factors were available in Eurostat and the standard weights could be calculated using Equation 2. When there were no relevant datasets in Eurostat to calculate a standard (live) weight for a specific animal species or category, as was the case for some

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[11] Live weights of animals were calculated using FAOSTAT slaughter data, where available, and conversion coefficients (to convert carcass weight to live weights at time of slaughter) defined by Eurostat.
[12] Aligned with recital 7 of Commission Implementing Regulation (EU) 2022/209 on comparability of data reported at national, EU and at global level.
[13] For the definition of carcass weight, please visit: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Carcass_weight

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food-producing animal species and for all non-food-producing animal species, the following hierarchy for establishing standard weights was followed:

- The estimated weight at treatment, as used in ESVAC [8, 9].
- The estimated weight at treatment, as published by Montforts [16].
- Other reference weight, duly justified, when none of the above apply.

A complete list of the standard weights (either calculated using reference Eurostat datasets or from published sources) that will be used to calculate the denominator can be found in Annex 1 and Annex 2.

## 5.3. Denominators per species and their categories

The information in the tables below should be read in conjunction with the 'Antimicrobial use data reporting per animal categories (numerator) - Manual for reporting the data to the Agency' [4].

### 5.3.1. Denominator for cattle

As per Article 15(1)(a) of Commission Delegated Regulation (EU) 2021/578, Member States must collect data on antimicrobial use for cattle, while distinguishing beef cattle from dairy cattle and specifying use in bovines under one year of age separately when the production of meat from slaughtered bovines under one year of age exceeds 10 000 tonnes per year. Table 1 presents the animal population data, data sources and the standard weights for calculation of the denominator for each of the cattle categories for which antimicrobial use must be reported. Table 2 presents the animal population data and standard weights for cattle traded between Member States for fattening or slaughter that should be used in the calculation of the denominator.

**Table 1.** Cattle categories for which antimicrobial use must be reported, animal population data source, and standard weights to calculate domestic cattle biomass.

| Cattle categories for which antimicrobial use must be reported | Animal population data and source | | Standard weight (kg)[1] |
|---|---|---|---|
| Beef cattle (inc. beef cattle for slaughter under one year of age) | Eurostat: A2110C (Male calves, less than 1 year old, not for slaughter) | Livestock | 314 |
| | Eurostat: A2120 (Male bovine animals, 1 to less than 2 years old) | Livestock | 500 |
| | Eurostat: A2300G (non-dairy cows) | Livestock | 595 |
| | Eurostat: A2130 (Male bovine animals, 2 years old or over) | Livestock | 680 |
| | Eurostat: A2220B (heifer, 1 year old, for slaughter) | Livestock | 440 |
| | Eurostat: A2230B (heifer, 2 years old or over, for slaughter) | Livestock | 564 |
| | Eurostat: B1100 (calves and young cattle) [2] | Slaughter | 314 |
| Dairy cattle | Eurostat: A2300F (Dairy cows) | Livestock | 595 |
| | Eurostat: A2210C (Female calves, less than 1 year old, not for slaughter) | Livestock | 314 |

| Cattle categories for which antimicrobial use must be reported | Animal population data and source | | Standard weight (kg)[1] |
|---|---|---|---|
| | Eurostat: A2220C (heifer, 1 year old, not for slaughter) | Livestock | 440 |
| | Eurostat: A2230C (heifer, 2 years old or over, not for slaughter) | Livestock | 564 |
| *Other cattle[3]* | n.a. | n.a. | n.a. |

[1] For detailed information on the weights please consult Annex 2.
[2] This age group of cattle is included in the monitoring of antimicrobial resistance population dataset, for which data is collected as specified by the legislation (former Directive 2003/99/EC and Commission Implementing Decision 2013/652/EU repealed by Commission Implementing Decision (EU) 2020/1729) [19].
[3] Antimicrobial use for this animal category should be reported to the Agency, if applicable. Animal population data are not available to calculate a denominator for this category, therefore, in its reports, the Agency should report antimicrobial use for this category with total use at the species level.

**Table 2.** Data for correcting trade movements between Member States for fattening or slaughter for cattle: data source and standard weights to calculate traded cattle biomass

| Animal movements | Animal population data source | Standard weight (kg)[1] |
|---|---|---|
| Cattle < 1 year of age for fattening | TRACES | 140 |
| Cattle < 1 year of age for slaughter | TRACES | 314 |
| Cattle > 1 year of age for fattening | TRACES | 500 |
| Cattle > 1 year of age for slaughter | TRACES | 623 |

[1] For detailed information on the weights see Annex 2.

The calculations of biomass per cattle category defined below should be read in conjunction with Table 21 and Table 22 (Annex 1).

Equation 3: **$Beef\ cattle_{biomass}$** $= Beef\ cattle > 1\ year_{biomass} + Beef\ cattle < 1\ year_{biomass}$

where

Equation 3.1: **$Beef\ cattle > 1\ year_{biomass}$** $=$
$Beef\ cattle > 1\ year_{domestic\ biomass} + Beef\ cattle > 1\ year_{OUT\ biomass} - Beef\ cattle > 1\ year_{IN\ biomass}$

Equation 3.1.1: **$Beef\ cattle > 1\ year_{domestic\ biomass}$** $=$
*number of livestock animals x standard weight*

Equation 3.1.2: **$Beef\ cattle > 1\ year_{OUT\ biomass}$** $=$
*total number of animals sent to another country for fattening or slaughter > 1 year age × standard weight*

Equation 3.1.3: **$Beef\ cattle > 1\ year_{IN\ biomass}$** $=$
*total number of animals brought in from another country for fattening or slaughter > 1 year age × standard weight*

Equation 3.2: **$Beef\ cattle < 1\ year_{biomass}$** $=$
$Beef\ cattle < 1\ year_{domestic\ biomass} + Beef\ cattle < 1\ year_{OUT\ biomass} - Beef\ cattle < 1\ year_{IN\ biomass}$

Equation 3.2.1: **$Beef\ cattle < 1\ year_{domestic\ biomass}$** $=$
*number of slaughtered animals x standard weight*

Equation 3.2.2: **Beef cattle < 1 year$_{OUT\ biomass}$=**
*total number of animals sent to another country for fattening or slaughter < 1 year age × standard weight*

Equation 3.2.3: **Beef cattle < 1 year$_{IN\ biomass}$=**
*total number of animals brought in from another country for fattening or slaughter < 1 year age × standard weight*

Equation 4: **Dairy cattle$_{biomass}$** *= Dairy cattle$_{domestic\ biomass}$ =*
*number of livestock animals x standard weight*

And defined at species level:

Equation 5: **Total cattle biomass** *= (3) Beef cattle biomass + (4) Dairy cattle biomass*

Correction of cattle biomass with TRACES data for cattle traded between Member States for slaughter and fattening will be performed only for the beef cattle category, as it concerns corrections for animals intended for fattening and slaughter only.

Of note, the total denominator for cattle may be slightly underestimated as animal populations pertaining to the antimicrobial use category *'Other cattle'* are not included.

## 5.3.2. Denominator for pigs

As per Article 15(1)(b) of Commission Delegated Regulation (EU) 2021/578, Member States must collect data on antimicrobial use for pigs, while specifying use in fattening pigs. Table 3 presents the animal population data, data sources and the standard weights that will be used for calculation of the denominator for each of the pig categories for which antimicrobial use must be reported. Table 4 presents the animal data and standard weights for pigs for fattening or slaughter traded between Member States that will be used in the calculation of the denominator.

**Table 3.** Pig categories for which antimicrobial use must be reported, animal population data source, and standard weights to calculate domestic pig biomass

| Pig category for which antimicrobial use must be reported | Animal population data and source | | Standard weight (kg)[1] |
|---|---|---|---|
| *Fattening pigs* | Eurostat: B3100 (pigmeat) | Slaughter | 120 |
| | Eurostat: A3120 (breeding sows >50 kg) | Livestock | 240 |
| *Other pigs[2]* | n.a. | n.a. | 240 |

[1] For detailed information on the weights please consult Annex 2.
[2] Antimicrobial use for this animal category should be reported to the Agency, if applicable. The Agency will report antimicrobial use for this category with total use at the species level.

During the assessment of the animal population datasets, it was considered to include the number of breeding sows (female pigs > 50 kg) on multiplication farms or selection centres in the '*Other pigs*' category. However, based on the EU survey responses (see Annex 3), this was deemed unfeasible due to unavailability of data at national level. Likewise, it was not possible to assign a standardised proportion of the Eurostat dataset A3120 (Breeding sows >50 kg) from the '*Fattening pigs*' denominator to the '*Other pigs*' denominator[14].

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[14] Of the 26 countries that responded to the survey 'Animal population statistics availability for the animal categories at risk of being treated with antimicrobial medicinal products' (Annex 3), 9 provided data or estimates of breeding sows at multiplication farms and selection centres. The proportion of breeding sows for meat production and the number of

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**Table 4.** Data for correcting trade movements between Member States for fattening or slaughter for pigs: data source and standard weights to calculate traded pig biomass

| Animal movements | Data source | Standard weights (kg)[1] |
|---|---|---|
| Pigs for fattening | TRACES | 25 |
| Pigs for slaughter | TRACES | 120 |

[1] For detailed information on the weights please consult Annex 2.

The calculations of biomass per pig category shown below should be read in conjunction with Table 21 and Table 22 (Annex 1).

Equation 6: ***Total pigs biomass*** **=**

*Fattening pigs$_{domestic\ biomass}$* + *Fattening pigs$_{OUT\ biomass}$*- *Fattening pigs$_{IN\ biomass}$*

where

Equation 6.1: ***Fattening pigs$_{domestic\ biomass}$***=
(*number of slaughtered animals x standard weight*) + (*number breeding sows x standard weight*)

Equation 6.2: ***Fattening pigs$_{OUT\ biomass}$***=
*total number of animals sent to another country for fattening or slaughter × standard weight*

Equation 6.3: ***Fattening pigs$_{IN\ biomass}$***
*total number of animals brought in from another country for fattening or slaughter × standard weight*

Of note, the total denominator for pigs may be slightly underestimated as animal populations pertaining to the antimicrobial use category *'Other pigs'* are not included.

## 5.3.3. Denominator for chickens

As per Article 15(1)(c) of Commission Delegated Regulation (EU) 2021/578, Member States must collect data on antimicrobial use for chicken, while specifying use in broilers and in laying hens. Table 5 presents the animal population data, data sources and the standard weights for calculation of the denominator for each chicken category for which antimicrobial use must be reported. Table 6 presents the animal data and standard weights for chickens traded between Member States for slaughter that will be used in the calculation of the denominator.

**Table 5.** Chicken categories for which antimicrobial use must be reported, animal population data source, and standard weights to calculate domestic chicken biomass

| Chicken categories for which antimicrobial use must be reported | Animal population data and source | | Standard weight (kg)[1] |
|---|---|---|---|
| *Broilers* | Eurostat: B7100 (chicken, incl. broilers and boiling hens) | Slaughter | 2.4 |

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breeding sows on multiplication farms and selection centres followed approximately either one of two patterns: a 50/50 divide or a 90/10 divide.

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| Chicken categories for which antimicrobial use must be reported | Animal population data and source | | Standard weight (kg)[1] |
|---|---|---|---|
| *Laying hens* | Eurostat: A5110OH (laying hens producing eggs for consumption) or national data[2] | Livestock | 2.4 |
| *Other chickens*[3] | n.a. | n.a. | n.a. |

[1] For detailed information on the weights please consult Annex 2.
[2] National data will be required, as data on laying hens producing eggs for human consumption will be collected and transmitted to Eurostat from 2025 onwards, as per Regulation (EU) 2022/2379 [12]. Of the 26 Member States responding to the EU survey, 20 collect national data for this animal population.
[3] Antimicrobial use for this animal category should be reported to the Agency, if applicable. Animal population data are not available to calculate a denominator for this category, therefore, in its reports, the Agency will report antimicrobial use for this category with total use at the species level.

During the assessment of relevant animal populations, it was considered to include the number of pullets (female chickens, <1 year, that have not started producing eggs) in the '*Laying hens*' category, and the number of laying hens not producing eggs for human consumption and the number of chickens kept at selection centres in the '*Other chickens*' denominator. However, based on the EU survey responses (see Annex 3), it was deemed unfeasible due to unavailability of data at national level or due to these animal categories not being kept.

**Table 6.** Data for correcting trade movements between Member States for slaughter for chickens: data source and standard weights to calculate traded chicken biomass

| Animal movements | Data source | Standard weight (kg)[1] |
|---|---|---|
| Chickens for slaughter | TRACES | 2.4 |

[1] For detailed information on the weights please consult Annex 2.

The calculations of the biomass per chicken category defined below should be read in conjunction with Table 21 and Table 22 (Annex 1).

Equation 7: $\textbf{Broilers}_{\textbf{biomass}} = Broilers_{domestic\ biomass} + Broilers_{OUT\ biomass} - Broilers_{IN\ biomass}$

where

Equation 7.1: $\textbf{Broilers}_{\textbf{domestic biomass}} = number\ of\ slaughtered\ animals\ x\ standard\ weight$

Equation 7.2: $\textbf{Broilers}_{\textbf{OUT biomass}} =$
*total number of animals sent to another country for slaughter × standard weight*

Equation 7.3: $\textbf{Broilers}_{\textbf{IN biomass}} =$
*total number of animals brought in from another country for slaughter × standard weight*

Equation 8: $\textbf{Laying hens}_{\textbf{biomass}} = Laying\ hens_{domestic\ biomass} =$

*number of laying hens x standard weight*

And defined at species level:

Equation 9: **Total chicken biomass = (7)** *Broilers biomass +* **(8)** *Laying hens biomass*

Correction of the chicken biomass with TRACES data will be performed at the category level for '*Broilers*' as it concerns corrections for animals intended for slaughter only.

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Of note, the total denominator for chickens may be slightly underestimated as animal populations pertaining to the antimicrobial use category *'Other chickens'* (e.g. breeding animals) are not included.

## 5.3.4. Denominator for turkeys

As per Article 15(1)(d) of Commission Delegated Regulation (EU) 2021/578, Member States must collect data on antimicrobial use for turkeys, while specifying use in fattening turkeys. Table 7 presents the animal population data, data sources and the standard weights that will be used for calculation of the denominator for the turkey categories for which antimicrobial use must be reported. Table 8 presents the animal data and standard weights for turkeys traded between Member States for slaughter that will be used in the calculation of the denominator.

**Table 7.** Turkey categories for which antimicrobial use should be reported, animal population data source, and standard weights to calculate domestic turkey biomass

| Animal species category for which antimicrobial use must be reported | Animal population data and source | | Standard weight (kg)[1] |
|---|---|---|---|
| *Fattening turkeys* | Eurostat: B7300 (turkey) | Slaughter | 13.2 |
| *Other turkeys[2]* | n.a. | n.a. | n.a. |

[1] For detailed information on the weights please consult Annex 2.
[2] Antimicrobial use for this animal category should be reported to the Agency, if applicable. Animal population data are not available to calculate a denominator for this category, therefore, in its reports, the Agency should report antimicrobial use for this category with total use at the species level.

**Table 8.** Data for correcting trade movements between Member States for slaughter for turkeys: data source and standard weights to calculate traded turkey biomass

| Animal movements | Data source | Standard weight (kg)[1] |
|---|---|---|
| Turkeys for slaughter | TRACES | 13.2 |

[1] For detailed information on the weights please consult Annex 2.

The calculations of the turkey biomass defined below should be read in conjunction with Table 21 and Table 22 (Annex 1).

Equation 10: **Total turkey biomass =**

*Fattening turkeys$_{domestic\ biomass}$ + Fattening turkeys$_{OUT\ biomass}$ - Fattening turkeys$_{IN\ biomass}$*

where

Equation 10.1: **Fattening turkeys$_{domestic\ biomass}$**= *number of slaughtered animals x standard weight*

Equation 10.2: **Fattening turkeys$_{OUT\ biomass}$**=
*total number of animals sent to another country for slaughter × standard weight*

Equation 10.3: **Fattening turkeys$_{IN\ biomass}$**=
*total number of animals brought in from another country for slaughter × standard weight*

Of note, the total denominator for turkeys may be slightly underestimated as animal populations pertaining to the antimicrobial use category *'Other turkeys'* (e.g. breeding animals) are not included.

## 5.3.5. Denominator for other poultry

As per Article 15(2)(a) of Commission Delegated Regulation (EU) 2021/578, Member States must collect data on antimicrobial use for other poultry (duck and geese). The use of antimicrobials in ducks and geese should be reported separately and thus, different denominators have to be established for these two species. Table 9 presents the animal population data, data sources and the standard weights that will be used for calculation of the denominator for other poultry species for which antimicrobial use must be reported.

**Table 9.** Other poultry species for which antimicrobial use must be reported, animal population data source, and standard weights to calculate domestic biomass for other poultry

| Other poultry species for which antimicrobial use must be reported | Animal population data and source | | Standard weight (kg)[1] |
|---|---|---|---|
| *Ducks* | Eurostat: B7200 (duck) | Slaughter | 4.2 |
| *Geese* | National data: slaughtered geese (reference dataset in Eurostat: B7410 (goose)[2]) | Slaughter | 6.7 |

[1] For detailed information on the weights please consult Annex 2.
[2] No data available in Eurostat reference dataset.

Table 10 presents the animal data and standard weights for ducks traded between Member States for slaughter that will be used in the calculation of the denominator. For geese, as there are no available data in the Eurostat reference database, Member States should take into account the number of animals brought in from other Member States and sent to other Member States for slaughter when reporting the number of slaughtered geese to the Agency, in accordance with Article 4(2) of the Commission Implementing Regulation (EU) 2022/209.

**Table 10.** Data for correcting trade movements between Member States for slaughter for ducks: data source and standard weights to calculate traded duck biomass

| Animal movements | Data source | Standard weight (kg)[1] |
|---|---|---|
| Ducks for slaughter | TRACES | 4.2 |

[1] For detailed information on the weights please consult Annex 2.

The calculations of the biomass for other poultry defined below should be read in conjunction with Table 21 and Table 22 (Annex 1).

Equation 11: **Total duck biomass =** $Duck_{domestic\ biomass} + Duck_{OUT\ biomass} - Duck_{IN\ biomass}$

Equation 11.1: **$Duck_{domestic\ biomass}$** = *number of slaughtered animals x standard weight*

Equation 11.2: **$Duck_{OUT\ biomass}$** =
*total number of animals sent to another country for slaughter × standard weight*

Equation 11.3: **$Duck_{IN\ biomass}$** =
*total number of animals brought in from another country for slaughter × standard weight*

Equation 12: **Total geese biomass =**
$Geese_{domestic\ biomass}$ = *number of slaughtered animals x standard weight*

## 5.3.6. Denominator for sheep

As per Article 15(2)(b) of Commission Delegated Regulation (EU) 2021/578, Member States must collect data on antimicrobial use for sheep. Table 11 presents the animal population data, data sources and the standard weights that will be used for calculation of the denominator for sheep for which antimicrobial use must be reported. Table 12 presents the animal data and standard weights for sheep traded between Member States for fattening or slaughter that will be used in the calculation of the denominator.

**Table 11.** Sheep population data source and standard weights to calculate the domestic sheep biomass

| Animal species for which antimicrobial use must be reported | Animal population data and source | | Standard weight (kg)[1] |
|---|---|---|---|
| *Sheep* | Eurostat: B4110 (lamb) | Slaughter | 29 |
| | Eurostat: A4100 (live sheep) | Livestock | 75 |

[1] For detailed information on the weights please consult Annex 2.

**Table 12.** Data for correcting trade movements between Member States for fattening and slaughter for sheep: data source and standard weights to calculate the traded sheep biomass

| Animal movements | Data source | Standard weight (kg)[1] |
|---|---|---|
| Sheep for fattening | TRACES | 20 |
| Sheep for slaughter | TRACES | 29 |

[1] For detailed information on the weights please consult Annex 2.

The calculations of sheep biomass defined below should be read in conjunction with Table 21 and Table 22 (Annex 1).

Equation 13: **Total sheep biomass =** $Sheep_{domestic\ biomass}$ + $Sheep_{OUT\ biomass}$ - $Sheep_{IN\ biomass}$

where

Equation 13.1: $\textbf{Sheep}_{\textbf{domestic biomass}}$=
(*number of slaughtered animals x standard weight*) + (*number live sheep x standard weight*)

Equation 13.2: $\textbf{Sheep}_{\textbf{OUT biomass}}$=
 *total number of animals sent to another country for fattening or slaughter × standard weight*

Equation 13.3: $\textbf{Sheep}_{\textbf{IN biomass}}$=
 *total number of animals brought in from another country for fattening or slaughter × standard weight*

## 5.3.7. Denominator for goats

As per Article 15(2)(c) of Commission Delegated Regulation (EU) 2021/578, Member States must collect data on antimicrobial use for goats. Table 13 presents the animal population data, data sources and the standard weights that will be used for calculation of the denominator for goats for which antimicrobial use must be reported. Table 14 presents the animal data and standard weights for goats traded between Member States for fattening or slaughter that will be used in the calculation of the denominator.

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**Table 13.** Goat population data source and standard weights to calculate the domestic goat biomass

| Animal species for which antimicrobial use must be reported | Animal population data and source | | Standard weight (kg)[1] |
|---|---|---|---|
| *Goats* | Eurostat: B4200 (goat meat) | Slaughter | 21 |
| | Eurostat: A4200 (live goats) | Livestock | 65 |

[1] For detailed information on the weights please consult Annex 2.

**Table 14.** Data for correcting trade movements between Member States for fattening or slaughter for goats: data source and standard weights to calculate traded goat biomass

| Animal movements | Data source | Standard weight (kg)[1] |
|---|---|---|
| Goats for fattening | TRACES | 20 |
| Goats for slaughter | TRACES | 21 |

[1] For detailed information on the weights please consult Annex 2.

The calculations for goat biomass defined below should be read in conjunction with Table 21 and Table 22 (Annex 1).

Equation 14: **Total goat biomass** = $Goat_{domestic\ biomass} + Goat_{OUT\ biomass} - Goat_{IN\ biomass}$

where

Equation 14.1: $Goat_{domestic\ biomass} =$
(*number of slaughtered animals x standard weight*) + (*number live goats x standard weight*)

Equation 14.2: $Goat_{OUT\ biomass} =$
 *total number of animals sent to another country for fattening or slaughter × standard weight*

Equation 14.3: $Goat_{IN\ biomass} =$
 *total number of animals brought in from another country for fattening or slaughter × standard weight*

## 5.3.8. Denominator for finfish

As per Article 15(2)(d) of Commission Delegated Regulation (EU) 2021/578, Member States must collect data on antimicrobial use for finfish, per species. Article 4 (1) of Commission Implementing Regulation (EU) 2022/209 defines the format for the animal population data as the biomass produced per year for farmed fish. Therefore, for each of the finfish species indicated in the legislation, an appropriate denominator should apply. Table 15 presents the reference Eurostat datasets from the database on 'production from aquaculture excluding hatcheries and nurseries' [fish_aq2a] for all finfish species for which antimicrobial must be reported.

**Table 15.** Finfish species for which antimicrobial use must be reported separately and source for the respective denominators (biomass of live weight produced)

| Finfish species for which antimicrobial use must be reported | Finfish production data source |
|---|---|
| Atlantic salmon | National data (reference dataset in Eurostat: [SAL] *Salmo salar*) |

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| Finfish species for which antimicrobial use must be reported | Finfish production data source |
|---|---|
| Rainbow trout | National data (reference dataset in Eurostat: [TRR] *Oncorhynchus mykiss*) |
| Gilthead seabream *(Sparus aurata)* | National data (reference dataset in Eurostat: [SBG] *Sparus aurata*) |
| European seabass *(Dicentrarchus labrax)* | National data (reference dataset in Eurostat: [BSS] *Dicentrarchus labrax*) |
| Common carp *(Cyprinus carpio)* | National data (reference dataset in Eurostat: [FCP] *Cyprinus carpio*) |

Requirements for Member States regarding data transmission frequency to Eurostat concerning aquaculture statistics are specified in Regulation (EC) No 762/2008 [13]. The deadline for submitting aquaculture data to Eurostat is 12 months after the end of the reference year, i.e. 12 months after the respective year for which data on use of antimicrobials should be reported. Thus, if finfish production data for the reporting year are not available in Eurostat's reference dataset, data must be provided by Member States. Statistics from the preceding calendar year can be used provisionally as a proxy until the data become available. It is the responsibility of Member States to report the correct finfish biomass to the Agency.

The denominator for each finfish species will correspond to their individual biomass of live weight produced.

## 5.3.9. Denominator for horses

As per Article 15(2)(e) of Commission Delegated Regulation (EU) 2021/578, Member States must collect data on antimicrobial use for horses (*Equus ferus caballus*), including ones declared as not being intended for slaughter for human consumption in the single lifetime identification document referred to in Article 114(1)(c) of Regulation (EU) 2016/429. Therefore, the denominator for horses should cover all living horses[15], whether being intended or not for slaughter for human consumption. Table 16 presents the animal population data, data sources and the standard weights that will be used for calculation of the denominator for horses for which antimicrobial use must be reported.

**Table 16.** Horse population data source and standard weight to calculate the domestic horse biomass

| Animal species for which antimicrobial use must be reported | Animal population data and source | Standard weight (kg)[1] |
|---|---|---|
| Horses | National data: living horses (livestock) | 400 |

[1] For detailed information on the weights please consult Annex 2.

The calculation for horse biomass is defined below.

Equation 15: **Total horse biomass =** $Horse_{domestic\ biomass}$ = *number of living horses x standard weight*

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[15] Available statistics on the living horse animal population cover all horses, whether being intended or not for slaughter for human consumption.

## 5.3.10. Denominator for rabbits

As per Article 15(2)(f) of Commission Delegated Regulation (EU) 2021/578, Member States must collect data on antimicrobial use for rabbits. Table 17 presents the animal population data, data sources and the standard weights that will be used for calculation of the denominator for rabbits, for which antimicrobial use must be reported.

**Table 17.** Rabbit population data source and standard weights to calculate the domestic rabbit biomass

| Animal species for which antimicrobial use must be reported | Animal population data and source | Standard weight (kg)[1] |
|---|---|---|
| Rabbits | National data: slaughtered rabbits (slaughter) | 2 |

[1] For detailed information on the weights please consult Annex 2.

As there are no available data for slaughtered rabbits in Eurostat, Member States should take into account the number of rabbits brought in from other Member States and sent to other Member States for slaughter when reporting the number of slaughtered rabbits to the Agency, in accordance with Article 4(2) of the Commission Implementing Regulation (EU) 2022/209.

The calculation for rabbit biomass is defined below.

Equation 16: **Total rabbit biomass =** $Rabbit_{domestic\ biomass}$=

*number of slaughtered animals x standard weight*

## 5.3.11. Denominator for any other food-producing animals of relevance

As per Article 15(2)(g) of Commission Delegated Regulation (EU) 2021/578, Member States must collect data on antimicrobial use for any other food-producing animals of relevance to them. In the Agency's manual for reporting antimicrobial use data [4] it is instructed to report use only for those production systems that are nationally relevant or where the use is of relevance.

The use of antimicrobials in this category is likely to be very small and it is not possible to predict for which species countries will report antimicrobial use in this category of animals, which are also likely to differ per country. Therefore, a denominator for this category of animals will not be defined[16].

## 5.3.12. Denominator for non-food-producing animals

As per Article 15(3) of Commission Delegated Regulation (EU) 2021/578, Member States must collect data on antimicrobial use for (a) dogs (b) cats, and (c) fur animals (minks and foxes). The use of antimicrobials in these four species must be reported separately. The Eurostat database does not include population statistics for these animal species.

Despite the mandatory model passport for the intra-Community movement of dogs, cats and ferrets [20], registration is only regulated at Member State level. While in some Member States registration of domestic dogs or cats is mandatory, in other Member States registration is not regulated. Many countries do not collect or have data with low coverage for these animal populations, as was observed from the responses to the EU Survey summarized in Annex 3.

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[16] In its annual reports, the Agency will report antimicrobial use for this category expressed in amounts of active substance.

Some national and local associations set a tracking tool for pets registered and uniquely identified with a transponder, EuroPetNet. Although lost animals can be tracked via this tool, the numbers of total registered cats and dogs are not publicly available per country. The European Pet Food Industry (FEDIAF)[17] publishes, on an annual basis, a report reviewing member association data on market and population trends, including the population of pet animals such as dogs and cats for 24 EU/EEA countries. Therefore, for those Member States that do not have in place a system collecting complete data on the population of dogs and cats in their territory, it is recommended to use FEDIAF figures as reference data to calculate the denominator for dogs and cats.

Table 18 presents the denominators parameters (population datasets, data format, weights) for the calculation of animal biomass for dogs and cats.

**Table 18.** Animal population source and standard weights to calculate dog and cat biomass)

| Animal species for which antimicrobial use must be reported | Animal population data and source | Standard weight (kg)[1] |
|---|---|---|
| Dogs | National data: living dogs[2] | 20 |
| Cats | National data: living cats[2] | 5 |

[1] For detailed information weights please consult Annex 2.
[2] In the absence of national data for dogs and/or cats the Agency will provide published figures from FEDIAF's annual reports as reference, which Member States should validate.

The calculations of the biomass of dogs and cats defined below

Equation 17: **Total dog biomass =** *number of living animals x standard weight*

Equation 18: **Total cat biomass =** *number of living animals x standard weight*

The denominators for fur animals will concern those Member States where minks (*Neovion vison*) and foxes (*Vulpes vulpes* and *Vulpes lagopus*) are kept for fur production and for which antimicrobial use must be collected and reported to the Agency. Fur production statistics for minks and foxes are usually presented as the number of pelts sold which does not necessarily reflect the actual fur animal population in the year of question as the furs may be stocked and thus sold another year.

Although there is limited scientific literature on fur animal biomass calculation, a methodology for estimating total mink biomass at farm level in relation to **the number of breeding females** has been proposed [21]. In this methodology, mink biomass is calculated taking into account several parameters in relation to each breeding female, including average breeding female weight, average litter size and average kit weight.

For the purpose of monitoring trends on the use of antimicrobials in minks across years at EU level and in Member States[18], the methodology for calculating denominator for minks is adapted from Jensen et al. [21]: minks biomass will be based on the number of breeding females multiplied by a standard weight that covers the weight of one breeding female and the total weight of the respective kits (see Annex 2 for more information). As breeding males will not be accounted for in this denominator, consequently, the animal population biomass will be underestimated, but trends in the use can still be followed.

Due to the lack of scientific publications on this topic for foxes, the methodology described to calculate mink biomass will be applied also for calculating the denominator for foxes. Table 19 presents the

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[17] FEDIAF: https://europeanpetfood.org/
[18] As per Article 15(3)(c) of the Commission Delegated Regulation (EU) 2021/578.

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parameters (species, data source and weights) for the calculation of animal biomass for minks and foxes. As for minks, fox breeding males will not be accounted for in this denominator, consequently, the animal population biomass will be underestimated, but trends in the use can still be followed.

**Table 19.** Animal population source and standard weights to calculate mink and fox biomass

| Animal species for which antimicrobial use must be reported | Animal population data and source | Standard weight (kg)[1] |
|---|---|---|
| Minks (*Neovison vison*) | National data: breeding females | 3.9 |
| Foxes (*Vulpes vulpes* and *Vulpes lagopus*) | National data: breeding females | 20 |

[1] For detailed weight information please consult Annex 2.

The calculations of the biomass of minks and foxes defined below.

Equation 19: **Total mink biomass =** *number of breeding females x standard weight*

Equation 20: **Total fox biomass =** *number of breeding females x standard weight*

# 6. Assessment of indicators

As per Article 57 of Regulation (EU) 2019/6, Member States must collect relevant and comparable data on the volume of sales and on the use of antimicrobial medicinal products used in animals, to enable in particular the direct or indirect evaluation of the use of such products in food-producing animals at farm level. Article 16 of Delegated Regulation (EU) 2021/578 further describes how the Agency should analyse the data reported by Member States, to identify trends and pattern changes across time, both at national and EU levels. As noted in Section 3 of this guideline, the indicators that should be used for the reporting of the sales and use data have not been specified in Commission Delegated Regulation (EU) 2021/578 or in Commission Implementing Regulation (EU) 2022/209.

In the context of this document the indicator, as a measure of exposure to antimicrobials, consists of a **numerator** derived from sales or use data and a **denominator** which represent the biomass of animals or the number of animals likely to be treated with antimicrobials in the year for which the data on sales or use has been reported to the Agency.

A weight-based indicator has been used to express quantities of antimicrobials sold or used (in mg) in the animal sector per animal biomass (in kg) at European (ESVAC) and at global (WOAH reports) level. In addition to weight-base indicators, **it is recommended to use dose- and course dose-based numerator for the use data indicator**. Dose- and course dose-based numerators have the advantage that they take into account differences in dosing between the active ingredients, formulations and animal species[19].

Data on the volume of sales must cover all sales per Member State of at least the antimicrobials listed in point 1 of the Annex to the Commission Delegated Regulation (EU) 2021/578 and data on use must cover all use per Member State territory of at least the antimicrobials listed in point 3 of that Annex for all animal species and categories or stages listed in Article 15. It is not possible to foresee how many Member States will report data on sales and on the use of the antimicrobials listed in points 2 and 4 of that Annex and how frequently such data will be provided to the Agency. When data (sales and use)

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[19] In human medicine, the numerator of the indicator used to report surveillance data of antimicrobial medicine products is dose-based - i.e., the number of defined daily doses (DDD) sold within a year has become widely used for the reporting of sales of antimicrobial human medicinal products since DDD values were established in the 1980s (https://www.whocc.no/atc_ddd_methodology/history/history).

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for antimicrobials listed in points 2 and 4 are collected and reported by Member States, the Agency will report them separately from those data falling under the scope of points 1 and 3.

The indicators proposed should not restrict the Agency of using additional reporting indicators after consulting with Member States.

## 6.1. Sales

Antimicrobial VMPs are typically marketed for multiple species for which dosing regimens may vary considerably and it is therefore not possible to report the sales data in terms of doses administered.

Weight-based indicators (given as mg antimicrobials per kg of estimated animal biomass) have been successfully employed for many years to quantify sales (as a proxy for consumption) of antimicrobial VMPs, as demonstrated by their use in the ESVAC project, JIACRA reports, and in the outcome indicators for antimicrobial consumption in food-producing animals jointly established by ECDC, EFSA and EMA [22]. This indicator will be used by the European Commission to monitor the Farm to Fork Strategy target of reducing overall EU sales of antimicrobials for farmed animals and in aquaculture by 50% by 2030 (see Section 7)[20,21,22].

As a conclusion, **the indicator for the mandatory reported sales of antimicrobial VMPs at EU level will be mg (active substance)/animal biomass (kg) and be reported as total sales, by class/subclass and by form, for the EU overall and by country as appropriate[23]**.

As per Article 16(6) of Commission Delegated Regulation (EU) 2021/578, the volume of sales of antimicrobial VMPs for food-producing animals and for other animals kept or bred[24] should be normalized by the respective denominator and reported separately[25]. The denominator for the sales of VMPs for food-producing animals will be sum of the food-producing animal species biomass as described in sections **5.3.1 to 5.3.10**. The denominator for the sales of VMPs for other animals kept or bred will be the sum of the non-food-producing animal species biomass as described in section **5.3.12**.

## 6.2. Use

In 2018, the Agency published a guideline on collection and provision of national data on antimicrobial use by animal species/categories suggesting three indicators for the use data, all normalized by animal biomass (in kg) [23]: 1) mg of active substance; 2) number of defined daily dose for animals (DDDvet); and 3) defined course dose for animals (DCDvet). Units of measurement of the proposed dose- and course dose-based indicators only cover oral and injectable products, however, DDDvet and DCDvet values have also been assigned for antimicrobial substances administered via intramammary products (both for cows in lactating and drying-off period) and intrauterine products. Moreover, surveillance of use in animals at EU level is mandatory for a list of antimicrobial medicinal products

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[20] Farm to Fork Strategy web page: https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en
[21] Farm to Fork Strategy action plan: https://food.ec.europa.eu/system/files/2020-05/f2f_action-plan_2020_strategy-info_en.pdf
[22] European Commission: Recommendations to the Member States as regards their strategic plan for the Common Agricultural Policy (COM/2020/846 final): https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0846
[23] To be determined by a working group dedicated to the analyses to be included in the Agency's future annual reports.
[24] Dogs, cats, minks and foxes are the four non-food-producing animal species for which use must be reported as per Article 15(3) of Commission Delegated Regulation (EU) 2021/578.
[25] It should be noted that it is not possible to separate completely sales of antimicrobial VMPs for food-producing animals and of for other animals kept or bred, as many of the antimicrobial veterinary medicinal products are marketed for two or more animal species. Some of the sales for food-producing animals could be used for non-food–producing animals such as companion animals, fur animals, exotic birds and racing pigeons. For instance, although some product forms, e.g. injectable products, are frequently marketed for both food-producing and companion animals, their sales will be included in the statistics of food-producing animals but as the overall use in companion animals is minor in terms of weight of active substance the overestimate of sales data for food-producing animals will be negligible (ESVAC reports). Tablets, on the other hand, are typically approved only for companion animals. Including the biomass of minks and foxes in the denominator (in addition to the biomass of dogs and cats), may result in an underestimation of this indicator.

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intended for systemic, intramammary and intrauterine use (point 3 of the Annex to Commission Delegated Regulation (EU) 2021/578).

Therefore, **mandatory use data will be reported as total use[26], use per animal species and categories, use by antimicrobial class/subclasses and use by administration route/product form, for the EU overall and by country as appropriate[27],** using the indicators listed in Table 20.

**Table 20.** Indicators for reporting antimicrobial use data in accordance with point 3 of the Annex to Commission Delegated Regulation (EU) 2021/578[1]

| # | Indicator | Administration routes/ forms |
|---|-----------|------------------------------|
| 1 | Active substance used (mg)/ animal biomass (kg)[2] per year | All product forms[1] |
| 2 | Number DDDvet used/animal biomass (kg) per year | Oral and injectable forms (systemic use) |
| 3 | Number DCDvet used/animal biomass (kg) per year | Oral and injectable forms (systemic use) |
| 4 | Number DDDvet used/number dairy cows per year | Intramammary products for lactating cows[3] |
| 5 | Number DCDvet used/number dairy cows per year | Intramammary products for lactating cows and cows during the drying-off period[3] |

[1] When voluntary data (under the scope of point 4 of the Annex to Commission Delegated Regulation (EU) 2021/578) are reported by Member States, the Agency should report these separately from those data falling under the mandatary scope.
[2] The same type of indicator (mg active substance adjusted for animal biomass in kg) is used to report quantitative data on antimicrobial agents intended for use by WOAH in its regional and global analysis.
[3] Use of intramammary products is not restricted to cattle. Although use in other species is minor in comparison with use of these products in cattle, it can be considered for future to expand this indicator to other species.

In addition, it might be considered relevant to present number DDDvet used/number dairy cows and Number DCDvet used/number dairy cows as indicators for intrauterine products.

Equations for each of the indicators listed in Table 20 and examples of calculations are provided in Annex 4.

The Agency has assigned DDDvet and DCDvet for different antimicrobials and pharmaceutical forms (i.e. oral and injectable products, intramammary products for the treatment of lactating animals or animals during the drying-off period, and intrauterine products) in the three major food-producing animal species: pigs, cattle and broilers [24-26]. Together with turkeys, these are the four species (as per Article 15(1) of the Commission Delegated Regulation (EU) 2021/578) for which use must be reported in the first phase of the stepwise approach, starting with 2023 data. Therefore, until specific DDDvet and DCDvet values for turkeys are assigned, those for broilers should be used as a proxy[28] [27].

A dedicated group should be established to assess the need to revise and update the current list of DDDvet and DCDvet values for pig, cattle, broilers (chicken) and turkey including values for some long-acting injectable products that are currently missing. Moreover, such an assessment should determine whether DDDvet and DCDvet values should be assigned for the other animal species for

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[26] DDDvet and DCDvet values with different units of measurement (e.g. for products for systemic use and intramammary use), use data cannot be aggregated.
[27] To be determined by a working group dedicated to the analyses to be included in the Agency's future annual reports.
[28] Of note, in a recent study by Joosten et al., estimated DDDvet for turkeys ranged from being 81.5% smaller to 48.5% larger compared to DDDvet for broilers. Once specific DDDvet values are assigned for turkeys, they should be applied retroactively.

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which use data have to be reported by the Member States[29], and for which pharmaceutical forms[30] [28, 29]. The assessment should also take into account the routes of administration in terms of their estimated impact on the selection of AMR as per the AMEG categorisation [30]. From the perspective of trends, if the existing EU DDDvet and DCDvet values are updated, they will be applied retroactively and the data re-analysed.

# 7. Farm to Fork Strategy: target to reduce overall EU sales of antimicrobials for farmed animals and in aquaculture by 50% by 2030

Recognising that AMR is a One Health problem that affects both human and animal health and the environment, the European Commission (EC) will take action to reduce the overall EU sales of antimicrobials for farmed animals and aquaculture by 50% by the year 2030, with 2018 as the reference year[31,32,33]. The 2018 reference value for the 27 EU Member States published in the 10th ESVAC report [31], i.e. total aggregated sales for farmed animals and aquaculture, is 118.3 mg/PCU, setting the 2030 target at 59.2 mg/PCU.

**Figure 1**. Farm to Fork Strategy baseline (2018, 118.3 mg/PCU) and target (2030, 59.2 mg/PCU) values of overall EU sales of antimicrobials for farmed animals and in aquaculture



118.3 mg/PCU
2018

59.2 mg/PCU
2030

As shown in Table 21 and Table 22, the animal population data as well as the weights to calculate the denominator that will be used to report data on sales (and use) in accordance with Article 57 of Regulation (EU) 2019/6 differ substantially from the denominator used for the voluntary data reporting of antimicrobial VMP sales for the ESVAC project. Moreover, the scope of antimicrobial VMPs for which data on the volume of sales must be collected by Member States and reported to the Agency, as per point 1 of the Annex to Commission Delegated Regulation (EU) 2021/578, is broader than that of the ESVAC project. Therefore, in order to continue measuring the overall progress towards the Farm to Fork Strategy target, the ESVAC methodology should be followed when analysing sales data for this purpose. This entails including only those antimicrobial VMPs with the ATCvet codes specified in the ESVAC protocol [8], all of which fall under the point 1 of the Annex to Commission Delegated Regulation (EU) 2021/578; calculating the PCU as for ESVAC (i.e. using the same animal categories and weights used to calculate PCU for the ESVAC reports); and excluding tablets from the data sets prior to the normalisation of sales by the PCU [8, 32].

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[29] As per Article 1 of Commission Implementing Decision (EU) 2020/1729, the monitoring and reporting of AMR must cover broilers, laying hens, fattening turkeys, fattening pigs, and bovine animals under one year of age.

[30] DDDvet and DCDvet for topical pharmaceutical forms (dermatological products, those for eye and ear and cutaneous spray) were not assigned as devising principles for establishment of DDDs for such products is generally difficult, as the dosing of the same product may vary substantially between different indications. This is in line with the approach applied for human medicine [28]. It should be noted that ESVAC data from five EU/EEA countries show that sales of topical forms for animals accounted for between 0.002% and 0.49% of total sales in 2012 [29].

[31] Farm to Fork Strategy web page: https://food.ec.europa.eu/horizontal-topics/farm-fork-strategy_en

[32] Farm to Fork Strategy action plan: https://food.ec.europa.eu/system/files/2020-05/f2f_action-plan_2020_strategy-info_en.pdf

[33] European Commission: Recommendations to the Member States as regards their strategic plan for the Common Agricultural Policy (COM/2020/846 final): https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52020DC0846

# Acronyms and key definitions

AMEG: Antimicrobial Advice *ad hoc* Expert Group (EMA)

AMR: antimicrobial resistance

ATC: Anatomical Therapeutic Chemical classification system

ATCvet: Anatomical Therapeutic Chemical classification system for veterinary medicinal products

CVMP: Committee for Veterinary Medicinal Products of EMA

DDDvet: defined daily doses for animals, a technical unit of measurement solely intended for the reporting of antimicrobial consumption.

DCDvet: defined course dose for animals, a technical unit of measurement solely intended for the reporting of antimicrobial consumption.

Denominators: for the purpose of this document, proxy for the animal population likely to be treated with antimicrobials within a reporting year, expressed as animal biomass (kg) per year and calculated based on a combination of the number of animals slaughtered during the data collection period and of the number of live animals present in a Member State at a given point during the data collection period, multiplied by standardised animal weights.

EC: European Commission

ECDC: European Centre for Disease Prevention and Control

EFSA: European Food Safety Authority

EMA: European Medicines Agency

ESVAC: European Surveillance of Veterinary Antimicrobial Consumption

EU: European Union

Eurostat: The statistical office of the EU, responsible for providing high-quality statistics that enable comparisons between countries and regions within the EU.

FAO: Food and Agriculture Organization

FEDIAF: European Pet Food Industry Federation

Indicators: in the context of this document, a measure of (animal) exposure to antimicrobials; it consists of a numerator derived from sales or use data and a denominator which represents the biomass of animals or the number of animals likely to be treated with antimicrobials in the year for which the data on sales or use are reported.

JIACRA: Joint Inter-agency Antimicrobial Consumption and Resistance Analysis

PCU: Population Correction Unit, established as a denominator for the sales data in the ESVAC project to normalise the total quantities of antibiotic active substance sold in each country by the animal population that could be potentially treated with these in each country. The PCU only includes food-producing animals, including horses and farmed fish and 1 PCU unit is equivalent to 1 kg of animal biomass.

TRACES: Trade Control and Expert System, the European Commission's online platform for sanitary and phytosanitary certification required for the importation of animals, animal products, food and

feed of non-animal origin and plants into the European Union, and the intra-EU trade and EU exports of animals and certain animal products.

VMP: Veterinary Medicinal Product

WHO: World Health Organization

WOAH (formerly OIE): World Organisation for Animal Health

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# Annex 1. Overview of the animal populations categories and weights for the denominators of sales and use data and for the ESVAC denominator

Table 21 lists the animal population categories and weights for the denominator of sales and use data. Animal categories and stages are only defined for used data, thus the denominator that will be used to report sales data for food-producing and non-food-producing animals will be the aggregated denominator for the animal species, categories and stages for which antimicrobial use data have to be reported as per Article 15 of Commission Delegated Regulation (EU) 2021/578.

**Table 21.** Overview of animal populations datasets, their data format and the weights that will be used to calculate the denominator for the sales and use data and used to calculate the ESVAC denominator

| Animal population data[1] | Data format | Animal population category | Animal population weight (kg) | ESVAC category | ESVAC weight (kg) |
|---|---|---|---|---|---|
| Male calves, less than 1 year old, not for slaughter (A2110C) | Livestock | Heads | Beef cattle | 314 | - | - |
| Male bovine animals, 1 to less than 2 years old (A2120) | Livestock | Heads | Beef cattle | 500 | - | - |
| Male bovine animals, 2 years old or over (A2130) | Livestock | Heads | Beef cattle | 680 | - | - |
| Non-dairy cows (A2300G) | Livestock | Heads | Beef cattle | 595 | - | - |
| Heifer, 1 year old, for slaughter (A2220B) | Livestock | Heads | Beef cattle | 440 | - | - |
| Heifer, 2 years old or over, for slaughter (A2230B) | Livestock | Heads | Beef cattle | 564 | - | - |
| Calves and young cattle (B1100) | Slaughter | Heads | Beef cattle (<1 year age) | 314 | Cattle | 140 |
| Heifers (B1240) | Slaughter | Heads | - | - | Cattle | 200 |
| Cows (B1230) | Slaughter | Heads | - | - | Cattle | 425 |
| Bullocks and bulls (B1210_1220) | Slaughter | Heads | - | - | Cattle | 425 |
| Dairy cows (A2300F) | Livestock | Heads | Dairy cattle | 595 | Cattle | 425 |
| Female calves, less than 1 year | Livestock | Heads | Dairy cattle | 314 | - | - |

| Animal population data[1] | Data format | Animal population category | Animal population weight (kg) | ESVAC category | ESVAC weight (kg) |
|---|---|---|---|---|---|
| old, not for slaughter (A2210C) | | | | | |
| Heifer, 1 year old, not for slaughter (A2220C) | Livestock | Heads | Dairy cattle | 440 | - | - |
| Heifer, 2 years old or over, not for slaughter (A2230C) | Livestock | Heads | Dairy cattle | 564 | - | - |
| Pigmeat (B3100) | Slaughter | Heads | Fattening pigs | 120 | Pigs | 65 |
| Breeding sows > 50 kg (A3120) | Livestock | Heads | Fattening pigs | 240 | Pigs | 240 |
| Chicken (B7100) | Slaughter | Heads | Broilers | 2.4 | Poultry | 1 |
| Laying hens producing eggs for human consumption (A5110OH) | Livestock | Heads | Laying hens | 2.4 | - | - |
| Turkey (B7300) | Slaughter | Heads | Fattening turkeys | 13.2 | Poultry | 6.5 |
| Duck (B7200) | Slaughter | Heads | Ducks | 4.2 | - | - |
| Goose (B7410) | Slaughter | Heads | Geese | 6.7 | - | - |
| Lamb (B4110) | Slaughter | Heads | Sheep | 29 | - | - |
| Live sheep (A4100) | Livestock | Heads | Sheep | 75 | Caprinae | 75 |
| Slaughtered sheep & goats (B4000) | Slaughter | Heads | - | - | Caprinae | 20 |
| Goat meat (B4200) | Slaughter | Heads | Goats | 21 | - | - |
| Live goats (A4200) | Livestock | Heads | Goats | 65 | - | - |
| Atlantic salmon ([SAL] *Salmo salar*) | Production | Biomass of live weight produced | Atlantic salmon | - | - | - |
| Rainbow trout ([TRR] *Oncorhynchus mykiss*) | Production | Biomass of live weight produced | Rainbow trout | - | - | - |
| Gilthead seabream ([SBG] *Sparus aurata*) | Production | Biomass of live weight produced | Gilthead seabream | - | - | - |

| Animal population data[1] | Data format | Animal population category | Animal population weight (kg) | ESVAC category | ESVAC weight (kg) |
|---|---|---|---|---|---|
| European seabass ([BSS] *Dicentrarchus labrax*) | Production | Biomass of live weight produced | European seabass | - | - | - |
| Common carp ([FCP] *Cyprinus carpio*) | Production | Biomass of live weight produced | Common carp | - | - | - |
| Fish ([F07] Total farmed fish) | Production | Biomass of live weight produced | - | - | Fish | - |
| Living horses | Livestock | Heads | Horses | 400 | Equidae | 400 |
| Slaughtered rabbits | Slaughter | Heads | Rabbits | 2 | Rabbits | 1.4 |
| Living dogs | Living animals | Heads | Dogs | 20 | - | - |
| Living cats | Living animals | Heads | Cats | 5 | - | - |
| Minks | Breeding females | Heads | Minks | 3.9 | - | - |
| Foxes | Breeding females | Heads | Foxes | 20 | - | - |

[1] When Eurostat dataset exists (even if data are not available), the respective label code is shown inside brackets for guidance (Eurostat codes may be subject to changes).

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**Table 22.** Overview of the animal trade movements between Member States for fattening or slaughter, data source and standard weights that will be used in the calculation of the denominators for the sales and use data and of the ESVAC denominator

| Animal population category | TRACES CN codes | Data format | Animal population category[1] | Animal population weight (kg) | ESVAC category | ESVAC weight (kg) |
|---|---|---|---|---|---|---|
| Cattle <1 year age for fattening | 0102 29 10 0102 29 21 0102 29 29 0102 02 29 41 0102 02 29 49 | Heads | Beef cattle < 1 year age | 140 | - | - |
| Cattle < 1 year age for slaughter | | Heads | Beef cattle < 1 year age | 314 | - | - |
| Cattle >1 year age for fattening | 0102 29 51 0102 29 59 0102 29 61 0102 29 69 0102 29 91 0102 29 99 | Heads | Beef cattle > 1 year age | 500 | - | - |
| Cattle > 1 year age for slaughter | | Heads | Beef cattle > 1 year age | 623 | - | - |
| Fattening bovine | 0102 | Heads | - | - | Cattle | 140 |
| Slaughtered bovine | 0102 | Heads | - | - | Cattle | 425 |
| Pigs for fattening | 0103 | Heads | Fattening pigs | 25 | Pigs | 25 |
| Pigs for slaughter | 0103 | Heads | Fattening pigs | 120 | Pigs | 65 |
| Chickens for slaughter | 0105 94 00 | Heads | Broilers | 2.4 | - | - |
| Turkeys for slaughter | 0105 99 30 | Heads | Fattening turkeys | 13.2 | - | - |
| Ducks for slaughter | 0105 99 10 | Heads | Ducks | 4.2 | - | - |
| Slaughtered poultry | 0105 | Heads | - | - | Poultry | 1 |
| Sheep for fattening | 0104 10 | Heads | Sheep | 20 | Caprinae | 20 |
| Sheep for slaughter | 0104 10 | Heads | Sheep | 29 | Caprinae | 20 |
| Goats for fattening | 0104 20 | Heads | Goats | 20 | Caprinae | 20 |
| Goats for slaughter | 0104 20 | Heads | Goats | 21 | Caprinae | 20 |

[1] Animal categories or stages are only defined for use data. The new denominator for sales will not make such distinction as it will be calculated per species based on the same animal population data as for use.

# Annex 2. Standard weights for the animal populations for the denominator of sales and use

**Table 23.** Calculated standard weights (live weights at slaughter) for the animal populations that will be included in the denominator of sales and use using reference slaughter datasets (heads and slaughtered biomass) and carcass weight conversion factors from Eurostat

| Selected slaughter datasets from Eurostat | Calculations[1] | Standard weight (kg)[2] | Notes[3,4] |
|---|---|---|---|
| B1100: calves and young cattle | $$B1100 \frac{slaughtered\ biomass\ (kg) / number\ animals\ (heads)}{conversion\ factor\ (0.54)}$$ | 314 | 2021 data from 26 countries (AT, BE, BG, HR, CY, CZ, DK, EE, FI, FR, DE, GR, HU, IE, IT, LV, LT, LU, MT, NL, PL, PT, RO, SI, ES, SE) |
| B1230: Cow | $$B1230 \frac{slaughtered\ biomass\ (kg) / number\ animals\ (heads)}{conversion\ factor\ (0.54)}$$ | 595 | 2021 data from 28 countries (AT, BE, BG, HR, CY, CZ, DK, EE, FI, FR, DE, GR, HU, IS, IE, IT, LV, LT, LU, MT, NL, PL, PT, RO, SK, SI, ES, SE) |
| B1210_B1220: Bullocks & bulls | $$B1210\_B1220 \frac{slaughtered\ biomass\ (kg) / number\ animals\ (heads)}{conversion\ factor\ (0.54)}$$ | 680 | 2021 data from 27 countries (AT, BE, BG, HR, CY, CZ, DK, EE, FI, FR, DE, GR, HU, IS, IE, IT, LV, LT, LU, MT, NL, PL, PT, RO, SI, ES, SE) |
| B1240: heifer | $$B1240 \frac{slaughtered\ biomass\ (kg) / number\ animals\ (heads)}{conversion\ factor\ (0.54)}$$ | 564 | 2021 data from 27 countries (AT, BE, BG, HR, CY, CZ, DK, EE, FI, FR, DE, GR, HU, IS, IE, IT, LV, LT, LU, MT, NL, PL, PT, RO, SI, ES, SE) |
| B1200: Adult cattle[5] | $$B1200 \frac{slaughtered\ biomass\ (kg) / number\ animals\ (heads)}{conversion\ factor\ (0.54)}$$ | 623[5] | 2021 data from 28 countries (AT, BE, BG, HR, CY, CZ, DK, EE, FI, FR, DE, GR, HU, IS, IE, IT, LV, LT, LU, MT, NL, PL, PT, RO, SK, SI, ES, SE) |
| B3100: pigmeat | $$B1300 \frac{slaughtered\ biomass\ (kg) / number\ animals\ (heads)}{conversion\ factor\ (0.78)}$$ | 120 | 2021 data from 28 countries (AT, BE, BG, HR, CY, CZ, DK, EE, FI, FR, DE, GR, HU, IS, IE, IT, LV, LT, LU, MT, NL, PL, PT, RO, SK, SI, ES, SE) |
| B7100: chicken | $$B7100 \frac{slaughtered\ biomass\ (kg) / number\ animals\ (heads)}{conversion\ factor\ (0.70)}$$ | 2.4 | 2021 data from 25 countries (AT, BE, BG, HR, CY, CZ, DK, FI, FR, DE, GR, HU, IS, IE, IT, LV, LT, MT, NL, PL, PT, RO, SI, ES, SE) |
| B7300: turkeys | $$B7300 \frac{slaughtered\ biomass\ (kg) / number\ animals\ (heads)}{conversion\ factor\ (0.70)}$$ | 13.2 | 2021 data from 17 countries (AT, BE, BG, HR, CY, CZ, DK, FI, FR, DE, GR, HU, |

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| Selected slaughter datasets from Eurostat | Calculations[1] | Standard weight (kg)[2] | Notes[3,4] |
|---|---|---|---|
| | | | IS, IE, IT, LV, LT, MT, NL, PL, PT, RO, SI, ES, SE) |
| B7200: ducks | $$B7200 \frac{\left. slaughtered\ biomass\ (kg) \middle/ number\ animals\ (heads) \right.}{conversion\ factor\ (0.67)}$$ | 4.2 | 2021 data from 9 countries (BE, BG, FR, GR, HU, IT, PL, PT, ES) |
| B4110: lamb | $$B4110 \frac{\left. slaughtered\ biomass\ (kg) \middle/ number\ animals\ (heads) \right.}{conversion\ factor\ (0.47)}$$ | 29 | 2021 data from 26 countries (AT, BE, HR, CY, CZ, DK, EE, FI, FR, DE, GR, HU, IS, IE, IT, LV, LT, LU, MT, NL, PL, PT, RO, SI, ES, SE) |
| B4200: goats | $$B4200 \frac{\left. slaughtered\ biomass\ (kg) \middle/ number\ animals\ (heads) \right.}{conversion\ factor\ (0.47)}$$ | 21 | 2021 data from 15 countries (AT, BE, CY, FR, DE, GR, IT, LV, MT, NL, PL, PT, SI, ES, SE) |

[1] Transformation of carcass weight to live weight at time of slaughter used conversion coefficients defined by Eurostat [18].
[2] Weighted mean standard animal live weight at the time of slaughter.
[3] For cattle, pigs, chickens and turkeys, Eurostat database accessed on 10/11/2022. For ducks, lamb and goats, Eurostat database accessed on 21/03/2023.
[4] Countries codes according to ISO 3166 — Codes for the representation of names of countries and their subdivisions
[5] This dataset does not distinguish between female and male animals, therefore, the calculate weight represents females and male animals.

**Table 24.** Overview of all animal populations to be included in the denominator of sales and use and corresponding standard weights

| Animal populations | Standard weight (kg) | Comments |
|---|---|---|
| • Male calves, less than 1 year old, not for slaughter (A2110C)<br>• Calve and young cattle (B1100)<br>• Female calves, less than 1 year old, not for slaughter (A2210C)<br>• Cattle <1 year age for fattening (TRACES) | 314 | Weight calculated from slaughter data from B1100: calve and young cattle. |
| • Male bovine animals, 1 to less than 2 years old (A2120)<br>• Cattle >1 year age for fattening (TRACES) | 500 | As it is not possible to calculate a weight specifically for this age category (no equivalent slaughtered data available), the standard weight was calculated as the mean weight of B1100 slaughtered calves and young cattle (314 kg) and of B1210_B1220 slaughtered bulls and bullocks (680 kg). |
| • Male bovine animals, 2 years old or over (A2130) | 680 | As it is not possible to calculate a weight specifically for this age/animal category (no equivalent slaughtered data available), the weight for slaughtered bulls and bullocks was chosen as it is the most similar animal category. Weight calculated from slaughter data from B1210_B1220: Bullocks & bulls. |
| • Non-dairy cows (A2300G)<br>• Dairy cows (A2300F) | 595 | Weight calculated from slaughter data from B1230: Cow. |
| • Heifer, 1 year old, for slaughter (A2220B)<br>• Heifer, 1 year old, not for slaughter (A2220C) | 440 | As it is not possible to calculate a weight specifically for this age category (no equivalent slaughtered data available), the standard weight was calculated as the mean weight of B1100 slaughtered calves and young cattle (314 kg) and of B1240 slaughtered heifers (564 kg). |

| Animal populations | Standard weight (kg) | Comments |
|---|---|---|
| • Heifer, 2 years old or over, for slaughter (A2230B)<br><br>• Heifer, 2 years old or over, not for slaughter (A2230C) | 564 | Weight calculated from slaughter data from B1240: heifer. |
| • Cattle <1 year age for fattening (TRACES) | 140 | Reference body weight at treatment used by ESVAC [8, 9][1]. |
| • Cattle > 1 year age for slaughter (TRACES) | 623 | Weight calculated from slaughter data from B1200: Adult cattle. |
| • Pigmeat (B3100)<br><br>• Pigs for slaughter (TRACES) | 120 | Weight calculated from slaughter data from B3100: pigmeat. |
| • Breeding sows >50 Kg (A3120) | 240 | Reference body weight at treatment used by ESVAC[1] [8]. |
| • Pigs for fattening (TRACES) | 25 | Reference body weight at treatment used by ESVAC[1] [8]. |
| • Chicken (B7100)<br><br>• Laying hens producing eggs for human consumption (A5110OH)<br><br>• Chickens for slaughter (TRACES) | 2.4 | Weight calculated from slaughter data from B7100: chicken. |
| • Turkey (B7300)<br><br>• Turkeys for slaughter (TRACES) | 13.2 | Weight calculated from slaughter data from B7300: turkey. |
| • Duck (B7200) | 4.2 | Weight calculated from slaughter data from B7200: duck. |

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| Animal populations | Standard weight (kg) | Comments |
|---|---|---|
| • Goose (B7410) | 6.7 | Weights for this species were not defined in ESVAC and are not described by Montforts [16]. The weight proposed is based on the average slaughter (carcass) geese weight described in a recent publication by J. Kozák [33] divided by the Eurostat's conversion carcass-to-live-weight conversion factor for geese (0.75)[2]. In this paper, the slaughter (carcass) weight of intensively reared broiler geese at 56-63 days of age is described as 5 kg. |
| • Lamb (B4110)<br>• Sheep for slaughter (TRACES) | 29 | Weight calculated from slaughter data from B4110: lamb. |
| • Live sheep (A4100) | 75 | As it is not possible to calculate a weight specifically for these animal populations (no equivalent slaughtered data available), the estimated body weight at treatment used by ESVAC[1] [8] was chosen. |
| • Sheep for fattening (TRACES) | 20 | Reference body weight at treatment used by ESVAC[1] [8]. |
| • Goat (B4200)<br>• Goats for slaughter (TRACES) | 21 | Weight calculated from slaughter data from B4200: goats. |
| • Goats for fattening (TRACES) | 20 | Reference body weight at treatment used by ESVAC[1] [8]. |
| • Live goats (A4200) | 65 | Weights for this species were not defined in ESVAC. The weight proposed is described by Montforts [16]. |
| • Living horses | 400 | Reference body weight at treatment used by ESVAC[1] [8]. |
| • Slaughtered rabbits | 2 | The weight proposed is described by Montforts [16]. |
| • Dogs | 20 | Weights for these species were not defined in ESVAC. The weights proposed are described in Guidelines on Pharmacovigilance for Medicinal Products for Veterinary Use (Volume 9B - Version October 2011) [34]. |
| • Cats | 5 | |
| • Minks | 3.9 | The standard weight was calculated as follows:<br><br>Average weight of breeding female (2 kg) + average litter size (5 kits/female) x average kit weight (0.37 kg/kit) |

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| Animal populations | Standard weight (kg) | Comments |
|---|---|---|
| | | Where; <br><br> • the average breeding female weight was calculated based on Danish and Finish weights of females in the spring at the time of whelping (personal communication): average breeding female weight ranged between 1.5-2 kg in Finland and 1.8-2.2 kg in Denmark; which are in line with Do and Miar [35] and Rond [36]; <br><br> • the average litter size was determined based on published and calculated figures from Danish and Finish papers and publications [21, 37]; <br><br> • there is limited published information on weight development of mink. Considering that a peak in antimicrobial use in mink has been observed during pre-weaning period in May-June [21, 38], weight at weaning was chosen for assigning the average kit weight and data was obtained from Karimi et al. [39]. |
| • Foxes | 20 | There are no published data on antimicrobial consumption for foxes during different production periods, therefore, the same principle for the standard weight for minks was followed: <br><br> Average weight of breeding female (10 kg) + average litter size (5 kits/female) x average kit weight (2 kg/kit) <br><br> Where; <br><br> • the average breeding female weight was assigned based on Finnish data [40] and personal communication with industry; <br><br> • the average litter size was determined based on published figures [37]; <br><br> • the average kit weight (at weaning) was calculated using Finnish data on fox weight development [40] (limited published information on weight development of fox). |

[1] ESVAC uses average weight at treatment defined by Montforts [16].
[2] Transformation of carcass weight to live weight at time of slaughter used conversion coefficients defined by Eurostat [18].

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# Annex 3. EU Survey on 'Animal population statistics availability for the animal categories at risk of being treated with antimicrobial medicinal products'

An EU survey was conducted to assess national 'Animal population statistics availability for the animal categories (denominator) at risk of being treated with antimicrobial medicinal products' and addressed to the EU/EEA countries via their ESVAC national contact points. The aim of this survey was to identify the availability of population data on relevant animal species and categories at national level which are currently not available in the EU databases, to support the decisions of (not) including certain animal populations categories in the denominators. In addition, the survey also aimed at identifying animal populations or species where coverage or data availability from national data sources would not be optimal.

Out of 29 countries invited, 26 countries[34] participated in the survey. The questions and the answers received are listed in Table 25.

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[34] Austria, Belgium, Bulgaria, Croatia, Cyprus, Czechia, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Luxembourg, Malta, Netherlands, Romania, Slovakia, Slovenia, Spain, Sweden, Iceland and Norway.

**Table 25.** Overview of the EU survey questions and responses received

| Question | Response Options | Total responses | Additional information from open text-fields | | |
|---|---|---|---|---|---|
| 2. Are annual data available on the number of heifers (female cattle, >1 year that have not calved) at dairy and meat production farms in your country? | If yes, Please indicate: data source (the competent authority or other organisations); annual figures (in number of animal heads) from the past 5 years or, if this is not possible, the latest available figures (indicating for which years they were collected) for the two populations; the frequency with which these data are collected; any confidentiality issues and any other relevant comments on the collection of data for this animal category in your country. | 15 | Data source | Competent Authority | 13 |
| | | | | Other | 2 |
| | | | Data provided | For past 5 years | 5 |
| | | | | For less than 5 years | 1 |
| | | | | Other data provided | 4 |
| | | | | No data provided | 5 |
| | | | Frequency of data collection | Daily | 3 |
| | | | | Annually | 5 |
| | | | | Biannually | 2 |
| | | | | Upon request | 1 |
| | | | | Not indicated | 4 |
| | | | Confidentiality Issues | No | 7 |
| | | | | Not indicated | 8 |
| | If yes but aggregated, Please indicate: the estimated proportion (%) of heifers on dairy farms and the estimated proportion of heifers on meat production farms with regards to the total heifer population, whether it was estimated by the competent authority or other organisations, and the methodology used to calculate this proportion; the frequency with which these data are collected; any confidentiality issues and any other relevant comments on the collection of data for this animal category in your country. | 7 | Estimation provided | Yes | 1 |
| | | | | No | 6 |
| | | | Data source | Competent Authority | 2 |
| | | | | Other | 2 |
| | | | | Not indicated | 3 |
| | | | Methodology indicated | Yes | 1 |
| | | | | No | 6 |
| | | | Frequency of data collection | Daily | 1 |
| | | | | Quarterly | 1 |
| | | | | Annually | 2 |
| | | | | Not indicated | 3 |
| | | | Confidentiality Issues | No | 3 |
| | | | | Not indicated | 4 |

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| Question | Response Options | Total responses | Additional information from open text-fields | | |
|---|---|---|---|---|---|
| | If no, please indicate: if there will be data available for this animal category in the future and, if this is the case, who will collect the data (competent authority or other organisation), the frequency of data collection and when the data are expected to become available; any other relevant comments on the future collection of data for this animal category in your country. | 4 | Availability of data in the future | Yes | 2 |
| | | | | Not indicated | 2 |
| | | | Future data collectors | Competent Authority | 2 |
| | | | | Not indicated | 2 |
| | | | Frequency of data collection | Annually | 0 |
| | | | | Upon request | 1 |
| | | | | Not indicated | 3 |
| 3. Are annual data available on the number of breeding sows (female pigs >50 kg) on multiplication farms or selection centres in your country? | If yes, please indicate: data source (the competent authority or other organisations); annual figures (in number of animal heads) from the past 5 years or, if this is not possible, the latest available figures (indicating for which years they were collected) for this animal category; the frequency with which these data are collected; any confidentiality issues and any other relevant comments on the collection of data for this animal category in your country. | 12 | Data source | Competent Authority | 7 |
| | | | | Other | 5 |
| | | | Data provided | For past 5 years | 3 |
| | | | | For less than 5 years | 3 |
| | | | | Other data provided | 4 |
| | | | | No data provided | 2 |
| | | | Frequency of data collection | Monthly | 1 |
| | | | | Annually | 8 |
| | | | | Upon request | 1 |
| | | | | Not indicated | 2 |
| | | | Confidentiality Issues | No | 4 |
| | | | | Not indicated | 8 |
| | | | Data reliability issues | Yes | 2 |
| | | | | Not indicated | 10 |
| | If yes but aggregated, Please indicate: the estimated proportion (%) of breeding sows for multiplication or selection purposes with regards to the total breeding sow population that is reported to Eurostat under the label A3120, whether it was estimated by the competent authority or other | 10 | Estimation provided | Yes | 1 |
| | | | | No | 9 |
| | | | Data source | Competent Authority | 2 |
| | | | | Other | 2 |
| | | | | Not indicated | 6 |
| | | | | Yes | 1 |

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| Question | Response Options | Total responses | Additional information from open text-fields | | |
|---|---|---|---|---|---|
| | organisations, and the methodology used to calculate this proportion; any confidentiality issues and any other relevant comments on the collection of data for this animal category in your country. | | Methodology indicated | No | 9 |
| | | | Frequency of data collection | Quarterly | 1 |
| | | | | Not indicated | 9 |
| | | | Confidentiality Issues | No | 4 |
| | | | | Not indicated | 6 |
| | If no, please indicate: if there will be data available for this animal category in the future and, if this is the case, who will collect the data (competent authority or other organisation), the frequency of data collection and when the data are expected to become available; any other relevant comments on the future collection of data for this animal category in your country. | 4 | Availability of data in the future | Yes | 1 |
| | | | | No | 1 |
| | | | | Not indicated | 2 |
| | | | Future data collectors | Competent Authority | 1 |
| | | | | Other | 1 |
| | | | | Not indicated | 2 |
| | | | Frequency of data collection | Not indicated | 4 |
| 4. Are annual data available on the number of laying hens (female chickens) producing eggs for human consumption in your country? | If yes, please indicate: data source (the competent authority or other organisations); annual figures (in number of animal heads) from the past 5 years or, if this is not possible, the latest available figures (indicating for which years they were collected) for this animal category; the frequency with which these data are collected; any confidentiality issues and any other relevant comments on the collection of data for this animal category in your country. | 20 | Data source | Competent Authority | 13 |
| | | | | Other | 7 |
| | | | Data provided | For past 5 years | 6 |
| | | | | For less than 5 years | 9 |
| | | | | No data provided | 5 |
| | | | Frequency of data collection | Monthly | 1 |
| | | | | Annually | 10 |
| | | | | Not indicated | 9 |
| | | | Confidentiality Issues | No | 7 |
| | | | | Not indicated | 13 |
| | If no, please indicate: if there will be data available for this animal category in the future and, if this is the case, who will collect the data (competent authority or other organisation), the | 6 | Availability of data in the future | Yes | 4 |
| | | | | Not indicated | 2 |
| | | | | Competent Authority | 2 |

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| Question | Response Options | Total responses | Additional information from open text-fields | | |
|---|---|---|---|---|---|
| | frequency of data collection and when the data are expected to become available; any other relevant comments on the future collection of data for this animal category in your country. | | Future data collectors | Other | 2 |
| | | | | Not indicated | 2 |
| | | | Frequency of data collection | Not indicated | 6 |
| 5. Are annual data available on the number of laying hens (female chickens) not producing eggs for human consumption but for breeding purposes in your country? | If yes, please indicate: data source (the competent authority or other organisations); annual figures (in number of animal heads) from the past 5 years or, if this is not possible, the latest available figures (indicating for which years they were collected) for this animal category; the frequency with which these data are collected; any confidentiality issues and any other relevant comments on the collection of data for this animal category in your country. | 15 | Data source | Competent Authority | 9 |
| | | | | Other | 6 |
| | | | Data provided | For past 5 years | 4 |
| | | | | For less than 5 years | 6 |
| | | | | No data provided | 5 |
| | | | Frequency of data collection | Annually | 10 |
| | | | | Every 2 years | 1 |
| | | | | Not indicated | 4 |
| | | | Confidentiality Issues | Yes | 1 |
| | | | | No | 5 |
| | | | | Not indicated | 9 |
| | If no, please indicate: if there will be data available for this animal category in the future and, if this is the case, who will collect the data (competent authority or other organisation), the frequency of data collection and when the data are expected to become available; any other relevant comments on the future collection of data for this animal category in your country. | 11 | Availability of data in the future | Yes | 5 |
| | | | | No relevant production | 2 |
| | | | | Not indicated | 4 |
| | | | Future data collectors | Competent Authority | 5 |
| | | | | Other | 2 |
| | | | | Not indicated | 4 |
| | | | Frequency of data collection | Monthly | 1 |
| | | | | Not indicated | 10 |
| 6. Are annual data available on the number of pullets (female chickens, < 1 year, that have not started producing eggs) in your country? | If yes, please indicate: data source (the competent authority or other organisations); annual figures (in number of animal heads) from the past 5 years or, if this is not possible, the latest available figures (indicating for which years they were | 16 | Data source | Competent Authority | 10 |
| | | | | Other | 6 |
| | | | Data provided | For past 5 years | 6 |
| | | | | For less than 5 years | 4 |
| | | | | Other data | 1 |

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| Question | Response Options | Total responses | Additional information from open text-fields | | |
|---|---|---|---|---|---|
| | collected) for this animal category; the frequency with which these data are collected; any confidentiality issues and any other relevant comments on the collection of data for this animal category in your country. | | | No data provided | 5 |
| | | | Frequency of data collection | Biannually | 1 |
| | | | | Annually | 6 |
| | | | | Every 2 years | 1 |
| | | | | Upon request | 1 |
| | | | | Not indicated | 7 |
| | | | Confidentiality Issues | Yes | 1 |
| | | | | No | 4 |
| | | | | Not indicated | 11 |
| | If no, please indicate: if there will be data available for this animal category in the future and, if this is the case, who will collect the data (competent authority or other organisation), the frequency of data collection and when the data are expected to become available; any potential confidentiality issues or any other relevant comments on the future collection of data for this animal category in your country. | 10 | Availability of data in the future | Yes | 5 |
| | | | | No | 1 |
| | | | | Not indicated | 4 |
| | | | Future data collectors | Competent Authority | 4 |
| | | | | Other | 2 |
| | | | | Not indicated | 4 |
| | | | Frequency of data collection | | |
| | | | | Not indicated | 10 |
| 7. Are annual data available on the number of chickens kept at selection centres (i.e. grandparents and great grandparents) in your country? | If yes, please indicate: data source (the competent authority or other organisations); annual figures (in number of animal heads) from the past 5 years or, if this is not possible, the latest available figures (indicating for which years they were collected) for this animal category; the frequency with which these data are collected; any confidentiality issues and any other relevant comments on the collection of data for this animal category in your country. | 9 | Data source | Competent Authority | 4 |
| | | | | Other | 4 |
| | | | | No relevant production | 1 |
| | | | Data provided | For past 5 years | 1 |
| | | | | For less than 5 years | 3 |
| | | | | No data provided | 5 |
| | | | Frequency of data collection | Annually | 2 |
| | | | | Upon request | 1 |
| | | | | Not indicated | 6 |
| | | | | No | 2 |

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| Question | Response Options | Total responses | Additional information from open text-fields | | |
|---|---|---|---|---|---|
| | | | Confidentiality Issues | Not indicated | 7 |
| | If yes but aggregated with total chicken population, please indicate: the estimated proportion (%) of chickens kept at selection centres regarding the total chicken population in your country, whether it was estimated by the competent authority or other organisations, and the methodology used to calculate this proportion; any confidentiality issues and any other relevant comments on the collection of data for this animal category in your | 0 | - | | |
| | If no, please indicate: if there will be data available for this animal category in the future and, if this is the case, who will collect the data (competent authority or other organisation), the frequency of data collection and when the data are expected to become available; any other relevant comments on the future collection of data for this animal category in your country. | 17 | Availability of data in the future | Yes | 7 |
| | | | | No | 2 |
| | | | | Not indicated | 4 |
| | | | | No relevant production | 4 |
| | | | Future data collectors | Competent Authority | 6 |
| | | | | Other | 2 |
| | | | | Not indicated | 9 |
| 8. Are annual data available on the number of turkeys not intended for fattening, i.e. breeding turkeys (parents, grandparents, great grandparents) and turkeys kept for egg hatching, in your country? | If yes, please indicate: data source (the competent authority or other organisations); annual figures (in number of animal heads) from the past 5 years or, if this is not possible, the latest available figures (indicating for which years were collected) for this animal category; the frequency with which these data are collected; any confidentiality issues and any other relevant comments on the collection of data for this animal category in your country. | 9 | Data source | Competent Authority | 5 |
| | | | | Other | 4 |
| | | | Data provided | For past 5 years | 1 |
| | | | | For less than 5 years | 4 |
| | | | | No data provided | 4 |
| | | | Frequency of data collection | Biannually | 1 |
| | | | | Annually | 3 |
| | | | | Every 2 years | 1 |
| | | | | Upon request | 1 |

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| Question | Response Options | Total responses | Additional information from open text-fields | | |
|---|---|---|---|---|---|
| | | | | Not indicated | 3 |
| | | | Confidentiality Issues | No | 3 |
| | | | | Not indicated | 6 |
| | If yes but aggregated, please indicate: the estimated proportion (%) of turkeys not intended for fattening regarding the total turkey population in your country, whether it was estimated by the competent authority or other organisations, and the methodology used to calculate this proportion; any confidentiality issues and any other relevant comments on the future collection of data for this animal category in your country. | 2 | Estimation provided | No | 2 |
| | | | Data source | Competent Authority | 1 |
| | | | | Not indicated | 1 |
| | | | Methodology indicated | No | 2 |
| | | | Frequency of data collection | Not indicated | 2 |
| | If no, please indicate: if there will be data available for this animal category in the future and, if this is the case, who will collect the data (competent authority or other organisation), the frequency of data collection and when the data are expected to become available; any other relevant comments on the future collection of data for this animal category in your country. | 15 | Availability of data in the future | Yes | 4 |
| | | | | No | 3 |
| | | | | No relevant production | 3 |
| | | | | Not indicated | 5 |
| | | | Future data collectors | Competent Authority | 5 |
| | | | | Other | 3 |
| | | | | Not indicated | 7 |
| 9. Are there geese production farms in your country? | Yes | 16 | - | | |
| | No | 10 | - | | |
| 9.1 Are annual data available on the number of slaughtered geese in your country? | If yes, please indicate: data source (the competent authority or other organisations); the frequency with which these data are collected; any confidentiality issues and any other relevant comments on the collection of data for this animal category in your country. | 10 | Data source | Competent Authority | 7 |
| | | | | Other | 3 |
| | | | Frequency of data collection | Monthly | 2 |
| | | | | Quarterly | 1 |
| | | | | Annually | 3 |
| | | | | Upon request | 1 |
| | | | | Not indicated | 3 |

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| Question | Response Options | Total responses | Additional information from open text-fields | | |
|---|---|---|---|---|---|
| | | | Confidentiality Issues | Yes | 1 |
| | | | | No | 3 |
| | | | | Not indicated | 6 |
| | If no, please indicate: if there will be data available for this animal category in the future and, if this is the case, who will collect the data (competent authority or other organisation), the frequency of data collection and when the data are expected to become available; any other relevant comments on the future collection of data for this animal category in your country. | 6 | Availability of data in the future | Yes | 3 |
| | | | | No | 2 |
| | | | | No relevant production | 1 |
| | | | Future data collectors | Competent Authority | 2 |
| | | | | Other | 1 |
| | | | | Not indicated | 3 |
| | | | Frequency of data collection | Not indicated | 6 |
| 10. Is there production of any of the following finfish species in your country: Atlantic salmon, rainbow trout, gilthead seabream, European seabass, common carp? | Yes | 23 | - | | |
| | No | 3 | - | | |
| 10.1 Are annual data available on the total biomass of finfish produced per species? | If yes, please indicate: data source (the competent authority or other organisations); the frequency with which these data are collected; any confidentiality issues and any other relevant comments on the collection of data for this animal category in your country. | 18 | Data source | Competent Authority | 12 |
| | | | | Other | 6 |
| | | | Frequency of data collection | Monthly | 3 |
| | | | | Annually | 10 |
| | | | | Not indicated | 5 |
| | | | Confidentiality Issues | Yes | 4 |
| | | | | No | 6 |
| | | | | Not indicated | 8 |
| | No, data are aggregated for all finfish species produced, please indicate: if total biomass produced will be collected in the future for any of | 1 | Availability of data per species in the future | Unknown | 1 |

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| Question | Response Options | Total responses | Additional information from open text-fields | | |
|---|---|---|---|---|---|
| | the finfish species indicated, and, if this is the case, who will collect the data (competent authority or other organisation), the frequency of data collection and when the data are expected to become available; any confidentiality issues and any other relevant comments on the collection of data for this animal category in your country. | | Data source | Competent Authority | 1 |
| | | | Frequency of data collection | Annually | 1 |
| | | | Confidentiality Issues | Unknown | 1 |
| | If no, please indicate: if there will be data available in the future for any of the finfish species indicated and, if this is the case, who will collect the data (competent authority or other organisation), the frequency of data collection and when the data are expected to become available; any other relevant comments on the future collection of data for this animal category in your country. | 4 | Availability of data per species in the future | Yes | 3 |
| | | | | Unknown | 1 |
| | | | Future data collectors | Competent Authority | 3 |
| | | | | Not indicated | 1 |
| | | | Confidentiality Issues | Yes | 1 |
| | | | | Not indicated | 3 |
| | | | Frequency of data collection | Monthly | 1 |
| | | | | Not indicated | 3 |
| 11. Are there rabbit production farms in your country? | Yes | 21 | - | | |
| | No | 5 | - | | |
| 11.1 Are annual data available on the number of slaughtered rabbits in your country? | If yes, please indicate: data source (the competent authority or other organisations); the frequency with which these data are collected; the average live weight at slaughter for this animal category for the past 5 years; any confidentiality issues and any other relevant comments on the collection of data for this animal category in your country. | 15 | Data source | Competent Authority | 14 |
| | | | | Other | 1 |
| | | | Frequency of data collection | Daily | 1 |
| | | | | Monthly | 2 |
| | | | | Annually | 4 |
| | | | | Upon slaughter | 2 |
| | | | | Not indicated | 6 |
| | | | Average live weight at | Yes | 3 |
| | | | | No | 12 |

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| Question | Response Options | Total responses | Additional information from open text-fields | | |
|---|---|---|---|---|---|
| | | | slaughter provided | | |
| | | | Confidentiality Issues | Yes | 1 |
| | | | | No | 5 |
| | | | | Not indicated | 9 |
| | If no, please indicate: if there will be data available for this animal category in the future and, if this is the case, who will collect the data (competent authority or other organisation), the frequency of data collection and when the data are expected to become available; any other relevant comments on the future collection of data for this animal category in your country. | 6 | Availability of data in the future | Yes | 1 |
| | | | | No | 1 |
| | | | | Not indicated | 4 |
| | | | Future data collectors | Competent Authority | 0 |
| | | | | Other | 4 |
| | | | | Not indicated | 2 |
| | | | Frequency of data collection | Not indicated | 6 |
| 12. The use of antimicrobials in other food-producing animals shall only be reported for those production systems that are nationally relevant or where the use of antimicrobials is of relevance. Is antimicrobial use expected to be reported for other food-producing animal species in your country? | If yes, for which other food-producing animal species that fit the description above is your country expecting to report data on antimicrobial use and why they are of relevance; if total biomass of slaughtered animals will be available and, if this is the case, who will collect the data (competent authority or other organisation) and the frequency of data collection; any confidentiality issues and any other relevant comments on the collection of data for this animal category in your country. | 10 | Species indicated | Yes | 1 |
| | | | | Yes, but some already part of another category | 8 |
| | | | | Unknown | 1 |
| | | | Availability of data in the future | Yes, slaughtered biomass | 1 |
| | | | | Yes, number of heads | 4 |
| | | | | For some species | 1 |
| | | | | Not indicated | 4 |
| | | | Future data collectors | Competent Authority | 5 |
| | | | | Not indicated | 5 |
| | | | Frequency of data collection | Daily | 1 |
| | | | | Annually | 2 |
| | | | | Not indicated | 7 |

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| Question | Response Options | Total responses | Additional information from open text-fields | | |
|---|---|---|---|---|---|
| | | | | No | 2 |
| | | | | Not indicated | 8 |
| | No | 16 | - | | |
| 13. Are annual data available on the number of dogs and cats in your country? | If yes, please indicate for dogs and cats separately: data source (the competent authority or other organisations); the estimated coverage of these animal species populations; any other relevant comments on the collection of data for this animal category in your country. | 13 | Data source | Competent Authority | 7 |
| | | | | Other | 6 |
| | | | Estimated coverage provided | For both | 7 |
| | | | | Only for dogs | 2 |
| | | | | Only for cats | 0 |
| | | | | Unknown | 1 |
| | | | | Not indicated | 3 |
| | | | Additional comments | Expected overestimation of dogs | 1 |
| | | | | Low coverage of cats | 3 |
| | | | | Only microchipped and vaccinated animals | 6 |
| | | | | Estimation from pet food supplies | 2 |
| | | | | None | 2 |
| | If no, please indicate for dogs and cats separately: if there will be data available for these animal species in the future and, if this is the case, who will collect the data (competent authority or other organisation), the frequency of data collection and when the data are expected to become available; the coverage that is expected to be achieved for each of these species; any other relevant comments on the future collection of data for this animal category in your country. | 13 | Availability of data in the future | Yes, for both | 1 |
| | | | | Only for dogs | 4 |
| | | | | No | 1 |
| | | | | Unknown | 6 |
| | | | | Not indicated | 1 |
| | | | Future data collectors | Competent Authority | 0 |
| | | | | Other | 5 |
| | | | | Not indicated | 8 |
| | | | Frequency of data collection | Continuous | 1 |
| | | | | Every 5 years | 1 |

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| Question | Response Options | Total responses | Additional information from open text-fields | | |
|---|---|---|---|---|---|
| | | | | Not indicated | 11 |
| 14. Are there fur production farms (minks and foxes) in your country? | Yes | 9 | - | | |
| | No | 17 | - | | |
| 14.1 Are there annual data available on the number of foxes or minks kept for fur production? | If yes, please indicate: data source (the competent authority or other organisations); if total animal population figures (in number of animal heads) are collected for these animal species; the frequency with which these data are collected; any confidentiality issues and any other relevant comments on the collection of data for this animal category in your country. | 5 | Data source | Competent Authority | 3 |
| | | | | Other | 2 |
| | | | Frequency of data collection | Annually | 2 |
| | | | | Not indicated | 3 |
| | | | Confidentiality Issues | Unknown | 1 |
| | | | | No | 1 |
| | | | | Not indicated | 3 |
| | If no, please indicate: if there will be data available for these animal species in the future and, if this is the case, who will collect the data (competent authority or other organisation), the frequency of data collection and when the data are expected to become available; the coverage that is expected to be achieved for each of these species; any other relevant comments on the future collection of data for this animal category in your country. | 4 | Availability of data in the future | No | 1 |
| | | | | Unknown | 2 |
| | | | | Not indicated | 1 |
| | | | Future data collectors | | |
| | | | | Not indicated | 4 |

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# Annex 4. Equations and examples for calculating antimicrobial use by the different indicators

**Table 26.** Equations for the calculation of the antimicrobial use indicators for the different administration routes/forms

| #Indicator | Administration routes/forms | Equations for calculation of indicator values |
|---|---|---|
| 1 | All product forms | $$active\ substance(s)\ used\ (mg)/animal\ biomass\ (kg) = \frac{mg}{animal\ biomass\ (kg)}$$ |
| 2, 3 | Oral and injectable forms (systemic use) | $$\frac{\frac{active\ substance(s)used\ (mg)}{DDDvet\ or\ DCDvet\ value\ (mg/kg)}}{animal\ biomass\ (kg)} = \frac{number\ of\ DDDvet\ or\ DCDvet\ used}{animal\ biomass\ (kg)}$$ |
| 4 | Intramammary products for lactating cows | $$\frac{\frac{number\ of\ intramammary\ injectors\ used}{DDDvet\ value(UD/teat)}}{number\ of\ dairy\ cows} = \frac{number\ of\ DDDvet}{number\ of\ dairy\ cows}$$ |
| 5 | Intramammary products for lactating cows and cows during drying-off period | $$\frac{\frac{number\ of\ intramammary\ injectors\ used}{DCDvet\ value\ (UD/udder)}}{number\ of\ dairy\ cows} = \frac{number\ of\ DCDvet}{number\ of\ dairy\ cows}$$ |

The tables below provide examples for the calculation of the different use indicators in fattening pigs and dairy cows in a Member State in year X.

**Table 27.** Example of animal population data in Member State A in year X

| Use species or category | Animal populations (heads) | Standard weights (kg) | Total animal biomass (kg) |
|---|---|---|---|
| Fattening pigs | • Slaughtered pigs: 16,000,000<br>• Breeding sows: 900,000 | • 120<br>• 240 | 2,136,000,000 |
| Dairy cows | • Dairy cows: 1,500,000<br>• Female calves, < 1 year old not for SL: 555,000<br>• heifer, 1 year old, not for slaughter: 400,000<br>• heifer, 2 years old or over, not for slaughter: 50,000 | • 595<br>• 314<br>• 440<br>• 564 | 1,270,970,000 |

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| Use species or category | Animal populations (heads) | | Standard weights (kg) | Total animal biomass (kg) |
|---|---|---|---|---|
| | Total head count: 2,505,000 | | | |

**Table 28.** Example of indicators for use of colistin as oral products (excluding premixes) in fattening pigs in year X for Member State A

| Use species or category | Total animal biomass (kg) | Use (kg) | DDDvet | DCDvet | #1: mg/kg animal biomass | #2: No. DDDvet/kg animal biomass | #3: No. DCDvet/kg animal biomass |
|---|---|---|---|---|---|---|---|
| Fattening pigs | 2,136,000,000 | 850 | 5 | 25 | **0.398** $$\frac{Use\ (mg)}{animal\ biomass\ (kg)}$$ | **0.080** $$\frac{\frac{Use\ (mg)}{DDDvet\ value}}{animal\ biomass\ (kg)}$$ | **0.016** $$\frac{\frac{Use\ (mg)}{DCDvet\ value}}{animal\ biomass\ (kg)}$$ |

**Table 29.** Example of indicators for use of cloxacillin intramammary products for lactating cows and cows during the drying-off period in year X for Member State A

| Use species or category | Total animal biomass (kg) | Total no. heads | Use (intramammary injectors) | | DDDvet | DCDvet | #1: mg/kg animal biomass | #4: No. DDDvet/number dairy cows | #5: No. DCDvet/number dairy cows |
|---|---|---|---|---|---|---|---|---|---|
| | | | kg | No. injectors | | | | | |
| Dairy cows | 1,270,970,000 | 2,505,000 | **Lactation period** | | 1 | 3 | **0.031** $$\frac{Use\ (mg)}{animal\ biomass\ (kg)}$$ | **0.072** $$\frac{\frac{no.\ intramammary\ injectors}{DDDvet\ value}}{no.\ of\ dairy\ cows}$$ | **0.024** $$\frac{\frac{no.\ intramammary\ injectors}{DCDvet\ value}}{no.\ of\ dairy\ cows}$$ |
| | | | 40 | 180,000 | | | | | |
| | | | **Drying-off period** | | n.a. | 4 | **0.615** | n.a. | **0.150** |
| | | | 800 | 1,500,000 | | | | | |

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