



Animal &
Plant Health
Agency

Livestock Demographic Data Group: Goat population report

**Livestock population density maps for GB, using
December 2023 and January 2024 data**

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Contributors:

Department of Epidemiological Sciences, APHA
Epidemiology and Risk Policy Advice team, APHA
Cattle Expert Group, Surveillance Intelligence Unit, APHA
Science Strategy and Planning Group, APHA
Field Epidemiology Team, APHA

Any enquiries regarding this publication should be sent to us at:

Freedom of Information (FOI), Environmental Information Regulations (EIR) and Subject Access requests: enquiries@apha.gov.uk

Livestock Demographics Data Groups (LDDG): lddg@apha.gov.uk

Rapid Analysis and Detection of Animal related Risk (RADAR) data warehouse: RADAR@apha.gov.uk

Epidemiology and Risk Policy Advice, APHA: erpa@apha.gov.uk

Data source: Sheep and Goat Inventory: Rapid Analysis and Detection of Animal related Risk (RADAR) data warehouse for England and Wales and ScotEID for Scotland

Data Year: Winter 2023 and 2024 (Sheep holdings on 1 December 2023 for England and Scotland, and 1 January 2024 for Wales)

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APHA is an Executive Agency of the Department for Environment, Food and Rural Affairs and also works on behalf of the Scottish Government, Welsh Government and Food Standards Agency to safeguard animal and plant health for the benefit of people, the environment and the economy.

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Who are these reports for and what is their purpose?

These reports are suitable for use in animal health and welfare policy work or by anyone who requires an estimate of the distribution and size of the goat population at Great Britain (GB) level. This type of population level information is often required to provide official statistical returns to the World Organisation for Animal Health (WOAH), assess the economic or social impact of particular animal health policies, for contingency, disease monitoring/control and resource planning, or to provide evidence to trading partners.

Who did this work?

The reports are produced by the Livestock Demographic Data Groups (LDDG). The LDDGs were formed in January 2014 and are made up of APHA representatives from data, epidemiology, species expert and GIS work groups.

What do the data show about the population?

The maps show the density of animals (Figure 1) and the density of holdings (Figure 2). The estimated number of holdings and number of goats per country is shown in Table 1. Compared to the December 2022 and January 2023 inventory, the number of goat holdings in GB has increased by 6% and the number of goats has increased by 5% (Table 1). The number of goat holdings has increased in England by 8.4% and Wales by 1.6% but decreased in Scotland by 12.9%. The number of goats has increased in England by 7.7%, remained approximately the same in Wales (0.1% decrease) and decreased in Scotland by 20.7%.

A livestock holding is defined as the land and buildings used to keep livestock. Each holding has a unique County Parish Holding (CPH). A livestock business can have more than one holding, which can include permanent holdings (used for more than one year) and temporary holdings (used for less than one year).

The maps reflect the common understanding of the GB goat population, as in previous years, showing that goat holdings are diffusely spread across England and Wales with areas of greater goat holding density in the south-west, south-east and western parts of England and in south Wales. There are relatively few goat holdings in Scotland. There are a few areas of high goat population density in the south-west and northern parts of England, which are likely to be due to a small number of large dairy goat units. Outside of these areas the goat density is less than one goat per km².

What do the data not show about the population?

The Sheep and Goat inventory is carried out during the winter and therefore does not capture any seasonal variation in the goat population, although the change in number of goats due to seasonality of breeding is not of the same magnitude as for sheep. According to the June 2023 Results of the Agricultural Survey, the total number of goats in GB in June 2023 was 109,534 ([Livestock populations in England - GOV.UK](#), [Survey of agriculture and horticulture: June 2024 | GOV.WALES](#), [Supporting documents - Results from the Scottish Agricultural Census: June 2024 - gov.scot](#)), which is similar to the total number of goats indicated by the winter 2023 and 2024 inventory – 114,824.

Due to the small size of the goat population in GB, the visual representation of population density is not very precise in areas of low density.

How accurate are the data?

There are important assumptions and uncertainties with these estimates which the user should take into consideration. Limitations of the dataset are discussed in detail in the data quality statement ([Annex 1](#)) and it is important that the user considers these in the context of their work. Population and holding density maps are each classified to different scales and units and due care must be taken regarding their interpretation.

The Sheep and Goat Inventory (Data from December 2023 for England and Scotland and January 2024 for Wales) holds information about the location and animal count of goat holdings in GB in winter. All sheep and goat keepers are required to register their holding and it is a legal requirement to complete the annual sheep and goat inventory. This is described in the data quality statement ([Annex 1](#)). The results are summarised in Table 1 and visualised in Figures 1 and 2.

Requests to fill in the inventory were sent to 112,011 holdings in GB that were previously recorded as keeping sheep and/or goats. The questionnaire was completed by 84,488 respondents, giving an overall return rate of 75.4%: 12,416 holdings were keeping goats¹.

For England, the inventory request was sent to 77,825 holdings, and responses were received from 60,218 respondents (77.4%): 10,236 holdings were keeping goats.

For Scotland, the inventory request was sent to 16,563 holdings, responses were received from 10,489 respondents (63.3%): 810 holdings were keeping goats.

¹ Note that some respondents reported keeping sheep and/or goats at more than one holding (CPH).

For Wales, the inventory request was sent to 17,623 holdings, responses were received from 13,781 respondents (78.2%): 1,370 holdings were keeping goats.

The data are therefore derived from the 12,416 goat holdings that returned a response to the inventory survey. In comparison, the response rates for the winter 2022 and 2023 inventory were 75.8% for England, 80.4% for Scotland and 78.7% for Wales. There has been a large drop-in response rate for Scotland which might be related to a change to e-mail reminders only and on-line only submissions for this inventory (See [Annex 1](#)) and might have contributed to the large decrease in the number of holdings and sheep in Scotland.

The characteristics of the non-responders are unknown, such as small ruminant holding type, and the effect of these missing data has not been evaluated, but assuming that many non-responders are no longer keeping sheep or goats, any underestimate in number of holdings and number of goats is likely to be small.

The sheep and goat inventory collects data on the number of animals kept on 1 December for England and Scotland, and on 1 January for Wales. It is not expected that the collection of data for England and Scotland one month earlier than for Wales would have any effect on the data.

How were the maps produced?

The maps have been created using the kernel density function in ArcGIS software. This tool distributes population information over a defined radius, creating a smooth density surface. Two key parameters that require adjustment are the search radius distance (15km radius for the maps presented within this report) and the size of the output surface grid; their selection is recognised as a subjective process (Pfeiffer et al., 2008). A search radius of 15km was deemed sufficient to enable distinction between categories and a 1km grid square was used for the density surfaces themselves. The legend categories were limited to six, to aid in cross referencing with areas of the map.

Comparison between the maps was optimised by assigning similar parameters between the species. However, further refinement of the parameters for each dataset could represent the information more accurately. Note that the ArcGIS Kernel Density tool does not take into account edge effects, and as such density estimates in and around coastal areas may be under estimated (Charpentier & Gallic, 2016).

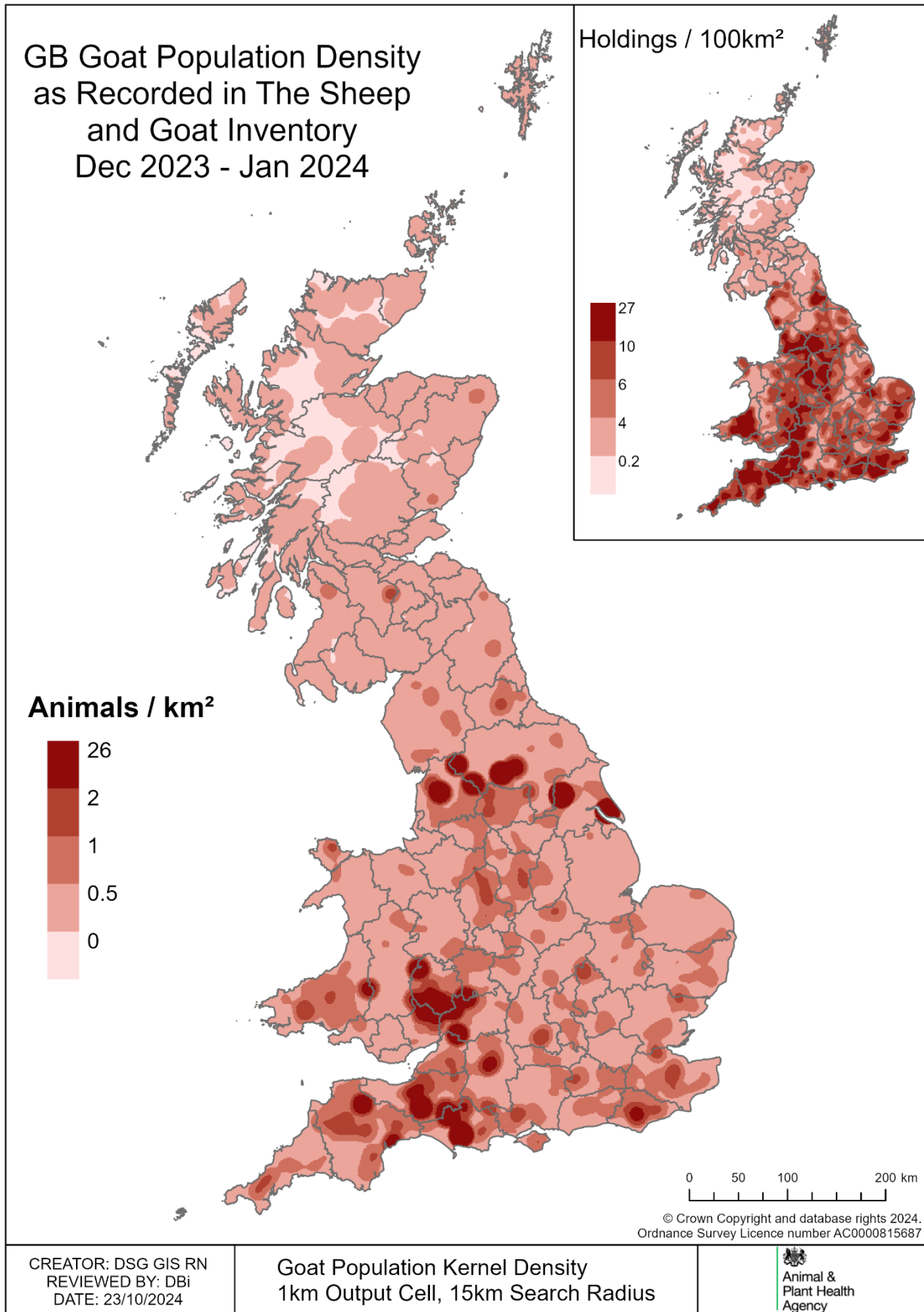


Figure 1. Goat population density in GB (Sheep and Goat Inventory December 2023 and January 2024)

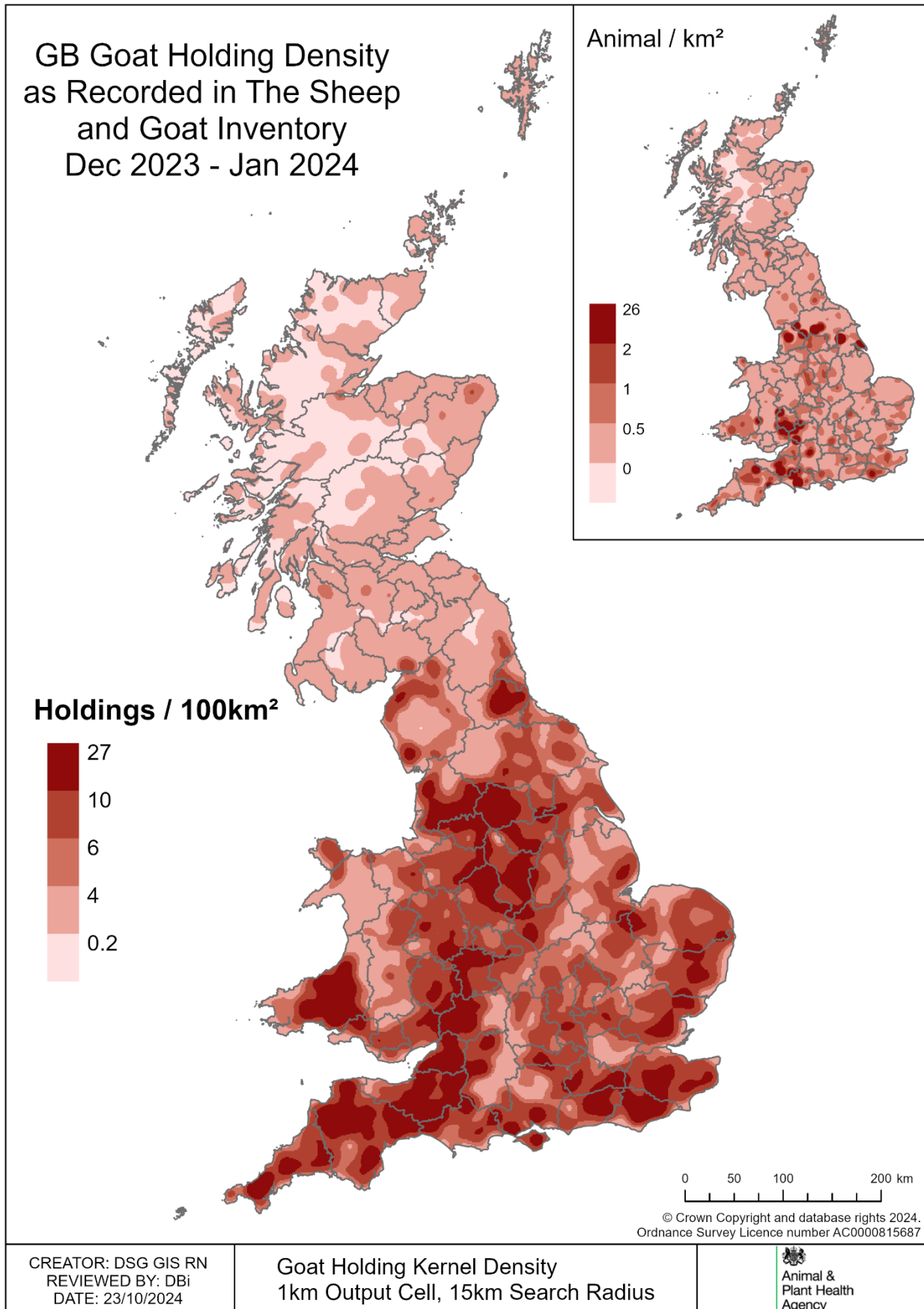


Figure 2. Goat holding density in GB (Sheep and Goat Inventory December 2023 and January 2024)

Table 1: Number of goat holdings and number of goats by country in GB, December 2023 and January 2024 compared to December 2022 and January 2023. The number of goat holdings and number of goats per county in December 2023 and January 2024 is provided in [Annex 2](#) and a reference map of all counties across GB is provided in [Annex 3](#).

Country	Dec 22 & Jan 23 Holdings	Dec 23 & Jan 24 Holdings	% Change	Dec 22 & Jan 23 goats	Dec 23 & Jan 24 goats	% Change
England	9,441	10,236	8.42%	91,965	99,046	7.70%
Scotland	930	810	-12.90%	6,672	5,290	-20.71%
Wales	1,349	1,370	1.56%	10,503	10,488	-0.14%
GB Total	11,720	12,416	5.94%	109,140	114,824	5.21%

Acknowledgements

The LDDG is grateful to Defra, Welsh Government, Scottish Government, and APHA's Data Systems Group (DSG) staff who handle the Sheep and Goat Inventory data and Rapid Analysis and Detection of Animal Related Risks (RADAR) data warehouse for their assistance in producing this report.

References

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- Pfeiffer, D. U., Robinson, T. P., Stevenson, M., Stevens, K. B., Rogers, D. J., & Clements, A. C. A. (2008). *Spatial Analysis in Epidemiology* (1st ed.). Oxford University Press.

Annex 1: Data quality statement for goats (December 2024)

Introduction

This data quality statement provides an overview of the quality of the data used to underpin the kernel density holding and livestock maps. This statement is written in the context of the data being used to provide an overview of the livestock demographics within Great Britain. The statement may not necessarily relate to data quality for other purposes.

Overview and purpose of source data used

Data were supplied by the Data Systems Group (DSG), APHA Weybridge and sourced from the Sheep and Goat Inventory via the Rapid Analysis and Detection of Animal-related Risks (RADAR) data warehouse.

The Sheep and Goat inventory was chosen to represent the sheep and goat data as this has the most inclusive coverage on holdings across GB. This dataset records the number of sheep and goats kept on all registered individual premises. The inventory data are collected once a year (1st of December for England and Scotland, and 1st of January for Wales) by means of a questionnaire which every registered sheep and goat holding in GB is requested to fill, and additional holdings recorded in Sam (APHA customer database). The questionnaire requests the number of sheep and/or goats kept per holding. This gives a winter count of the population. For the winter 2023 and 2024 inventory there was a response rate of 77.4% for England, 63.3% for Scotland and 78.2% for Wales. In comparison, the response rates for the winter 2022 and 2023 inventory were 75.8% for England, 80.4% for Scotland and 78.7% for Wales.

The Agricultural Survey was also considered as a source of data; however, response rates have been lower compared to the Sheep and Goat Inventory. These data are collected in the summer months. However, this survey only collects data on larger agricultural holdings and not on smaller holdings. Additionally, it is only sent to a sample of holdings each year, with a full census only occurring every ten years. It was therefore decided that the sheep and goat inventory gave a better picture of all holdings in Great Britain, but the agricultural survey could be used if a summer count was required.

The Animal Movement Licensing System database (AMLS) was also considered as a source of data, but this only shows movements of batches of animals and not the number of animals on the holding so it was decided this was not suitable.

Relevance of data

The degree to which data meets user needs in terms of currency, geographical coverage, content and detail.

Spatial coverage: the data cover GB (England, Scotland and Wales).

Temporal coverage: the data presented are for 1 December 2023 (England and Scotland) and 1 January 2024 (Wales). The data were accessed in August 2024.

Key data items available: the dataset includes species (sheep or goat) and number of animals on holding, purpose of holding, CPH, name and address of keeper or holding.

Timeliness

The degree to which data represent reality from the required time point.

How often are the data collected? The data are collected annually on 1 December for England and Scotland, and 1 January for Wales.

When do the data become available? The data are available and uploaded into RADAR about 6 months after the survey is collected by the Defra Statistics Team.

Data reference period: the data are a snapshot at the date of the survey.

How often are the data updated? Data are updated annually.

Accuracy and precision

The extent of data error and bias and how well data portrays reality.

How were the data collected? For England and Wales, questionnaires are sent once a year by post or by email to all holdings that have registered or are recorded as keeping sheep or goats. The questionnaire can be completed online or by post. For Scotland, there was a change in procedure for this inventory: only emails were sent to remind keepers to complete the inventory and they could only submit their data online.

Sample and collection size: all holdings registered or recorded as keeping sheep or goats are required to complete the inventory, so the survey is intended to be a full census of all known potential goat holdings. It is not known how many other holdings are keeping goats that have not registered or been recorded in the England Livestock Information Service (LIS), ScotEID, EIDCymru or Sam. The counts of holdings and number of goats are obtained from all the holdings that have returned the inventory form.

Further information on rules for registering a holding where sheep and goats are kept:

Find information on how to:

- [apply for a county parish holding \(CPH\) number](#)
- [register livestock to get a flock or herd mark](#)

What steps have been taken to minimise processing errors? The data collected through the survey are subject to manual validation to check the data accuracy. Not all data that fail validation can be corrected/confirmed as the survey team cannot always get in contact with the keeper. There are several different errors that can be detected such as incorrect flock number or illegible forms. The team check every form and verify the information where possible.

What are the response rates? Response rates for the surveys conducted in December 2023 and January 2024 were 77.4% for England, 63.3% for Scotland and 78.2% for Wales.

Are any parts of the population unaccounted for in the data collection? The Defra Statistics Team did not receive returns from around 22.62% of holdings in England, 36.7% of holdings in Scotland and 21.8% holdings in Wales to which the questionnaires were sent. However, it is not known whether non-responders represent particular types of small ruminant keeper or those no longer keeping small ruminants. There may also be holdings that are not registered or recorded, and therefore did not receive the request to complete the inventory form. In order to minimise the number of holdings not represented, information about the annual inventory and how to access the questionnaire is shared through various social media alerts.

Find guidance on [how to register your holding and flock or herd](#) and [how to keep and update a holding register in the annual sheep and goat inventory](#).

Comparability

How well these data can be compared with data taken from the same dataset and with similar data from other sources.

Within dataset comparability: the format and survey methods are similar between years. However, for the December 2023 inventory, Scotland only used email to request keepers to complete the inventory, and data were collected on-line only. Whereas in previous years, keepers were notified by post and could submit a paper questionnaire.

Other dataset comparability: the data compare with the Agricultural Survey, which shows data collected in the summer. The June 2023 Survey of Agriculture was a full census of commercial holdings that indicated that the total number of goats in GB in June 2023 was 109,534. This total is similar to the total number of goats indicated by the winter 2023 and 2024 inventory – 114,824. Animal Movement Licensing System (AMLS) holds movement data, which can compare information on holding locations and relative sizes.

However, both datasets have a difference in data capture, as does data held within Sam.

Coherence

The degree to which data can be or have been merged with other data

sources.

How consistent are the data over time? If there are differences, what are they and what is their impact? Have there been changes to the underlying data collection?

The list of keepers contacted in connection with their annual inventory obligation is derived from the list of holdings statutorily maintained by APHA for England, Scottish government and Welsh government. Returns from those keepers who declare they are no longer keeping sheep or goats are used to update that list, and in turn update subsequent inventory-gathering exercises. For the December 2023 inventory, Scotland changed to on-line only data collection, whereas in previous years, keepers were notified by post and could submit a paper questionnaire.

Have any real world events impacted on the data since the previous release? No.

What other data sources are these data comparable with? Location data are comparable between the Agricultural survey, Sam and the Animal Movement Licensing System (AMLS). The Agricultural survey data have been used for total population and the AMLS for total holdings.

What other data sources in society report similar information? How do these data sources compare? Industry has their own datasets but these are obtained from, for example, the sheep and goat inventory and Agricultural Survey. It is thought they are unlikely to offer any additional information.

Interpretability

How well the data are understood and utilised appropriately.

Is there a particular context that these data need to be considered within? The sheep and goat inventory is conducted in the winter, but seasonality in the goat population is minimal so the data provided are unlikely to vary much by season.

What other information is available to help users better understand this data source? Guidance is available on the complete your [annual sheep and goat inventory](#) page.

Are there any ambiguous or technical terms that may need further explanation? No.

Accessibility

The availability of relevant information and access to these data in a convenient and suitable manner.

What data are shared and with whom? Addresses and coordinates of individual locations cannot be released without Confidentiality Agreements. DSG access data through RADAR or directly from Scottish government.

Contact details for data source queries:

- Agricultural Survey England: Farming-statistics@defra.gov.uk
- Agricultural Survey Wales: Stats.agric@wales.gov.uk
- Agricultural Survey Scotland: agric.stats@scotland.gov.uk
- ScotEID Livestock Traceability - support@scoteid.com
- Freedom of Information (FOI), Environmental Information Regulations (EIR) and Subject Access requests - enquiries@apha.gov.uk

Annex 2: Number of goat holdings and number of goats per county

Table 2: Total number of goat holdings and number of goats per county for England, based on the results from the GB Sheep and Goat Inventory for December 2023 and January 2024. Data for counties with 6 or fewer holdings have been excluded from this table for data protection reasons.

County	Number of goat holdings	Number of goats
Avon	195	963
Bedfordshire	82	907
Berkshire	99	528
Buckinghamshire	128	801
Cambridgeshire	176	1,312
Cheshire	187	961
Cleveland	35	131
Cornwall and Isles of Scilly	404	1,846
Cumbria	352	2,176
Derbyshire	315	1,523
Devonshire	743	6,604
Dorset	248	8,313

County	Number of goat holdings	Number of goats
Durham	195	1,028
East Sussex	204	1,885
Essex	313	1,640
Gloucestershire	245	3,958
Greater London	68	387
Greater Manchester	156	726
Hampshire	287	1,849
Herefordshire	196	6,060
Hertfordshire	110	635
Humberside	225	12,351
Isle of Wight	57	443
Kent	364	2,396
Lancashire	309	4,862
Leicestershire	171	1,009
Lincolnshire	317	1,551
Merseyside	35	178
Norfolk	386	1,926
North Yorkshire	444	7,597
Northamptonshire	127	796
Northumberland	108	818
Nottinghamshire	137	745
Oxfordshire	152	1,215

County	Number of goat holdings	Number of goats
Shropshire	255	1,231
Somerset	399	4,676
South Yorkshire	148	681
Staffordshire	309	1,782
Suffolk	285	1,530
Surrey	169	1,122
Tyne & Wear	29	116
Warwickshire	133	903
West Midlands	50	256
West Sussex	182	897
West Yorkshire	304	1,507
Wiltshire	214	1,985
Worcestershire	195	2,260

Table 3: Total number of goat holdings and number of goats per county for Scotland, based on the results from the GB Sheep and Goat Inventory for December 2023 and January 2024. Data for counties with 6 or fewer holdings have been excluded from this table for data protection reasons.

County	Number of goat holdings	Number of goats
Aberdeenshire	93	733
Angus	32	255
Argyll	38	149
Ayrshire	59	450
Banffshire	19	168

County	Number of goat holdings	Number of goats
Berwickshire	21	109
Bute	21	125
Caithness	55	306
Dumfriesshire	10	104
East Lothian	28	146
Fife	39	196
Inverness-shire	19	162
Kincardineshire	32	196
Kinross	93	733
Kirkcudbright	32	255
Lanarkshire	46	493
Midlothian & Edinburgh	12	70
Moray	11	61
Orkney	7	22
Peebles	20	71
Perth	10	46
Ross & Cromarty	53	426
Roxburgh	43	203
Shetland	23	209
Stirling	14	42
Sutherland	10	54
West Lothian	20	106
Wigtown	10	44

Table 4: Total number of goat holdings and number of goats per county for Wales, based on the results from the GB Sheep and Goat Inventory for December 2023 and January 2024. Data for counties with 6 or fewer holdings have been excluded from this table for data protection reasons.

County	Number of goat holdings	Number of goats
Clwyd	137	757
Dyfed	545	4,188
Gwent	128	2,320
Gwynedd	165	1,140
Mid Glamorgan	75	356
Powys	235	1,367
South Glamorgan	25	85
West Glamorgan	59	270

Annex 3: GB Counties Reference map

