STATISTICS DENMARK

Documentation of statistics for Harvest of Cereals etc. 2024

Statistics Denmark
Sankt Kjelds Plads 11
DK 2100 København Ø

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1 Introduction

The purpose of harvest of grains etc. is to describe the Danish harvest of grain and roughage. The statistics are used for research, EU reporting, GDP calculation and energy and feed accounts. The statistics have been compiled since 1875, but are in their present form comparable from 1971 onwards. Corresponding statistics on vegetable production: 'Production of fruit and vegetables', 'Nursery production', 'Berry and stone fruit'. This data is collected via the Agriculture and Horticulture survey.

2 Statistical presentation

The harvest of cereals, etc. is an annual estimate of the Danish harvest of grain, root crops and roughage in area (1000 hectares), average yield (100 kg per hectare) and production (million kg). The statistics are calculated by crops and broken down by provinces.

2.1 Data description

** The harvest of cereals etc **

Calculation of the Danish grain harvest based on reports from farmers. Final harvest statistics go back to 1875. In addition the total production and use of straw is measured.

Crops covered: winter wheat, -barley, -raps, spring wheat, barley, rape, rye, oats, triticale, cereals, field peas, horse beans and mixed cereals.

Annual statistics on straw has been produced since 1970, and straw application since 1972.

The statistics on harvest of cereals etc. is first and foremost a production inventory.

Includes harvest of winter wheat, winter barley, winter rape, wheat, barley, rape, rye, oats, triticale, cereals, field peas and mixed crops. For each crop, questions are asked on arable land, total yield (hekto kilo), average yield (hekto kilo / hectare) and water percent if the production does not appear in dried weight. Water percentage is used to calculate standard moisture content (15 per cent for cereals and peas and 9 per cent for rape).

Harvest of grain maize and corn cob mix is included in the statistics from 2011.

Statistics on straw show the production and use of straw by the above-mentioned crops. Output is measured as a relation between yield (grain, rape and peas) and expected straw yield, while the use of straw is based on questionnaire information on the distribution of straw areas used for firing, for fodder, for other purposes.

From 2006 the results are compiled for the new administrative structure in Denmark (regions). Regions are divided on specific agricultural land (sub-divisions of regions).

** Harvest of roughage **

Includes harvest of sugar beet, potatoes and roughage plus grain and corn harvested for silage or green fodder.

Yields per hectare are collected from SEGES for potatoes, from Danish association of sugar beets farmers for sugar beets whereas fodder crops are collected from the accounts statistics for agriculture.

This information on yields is combined with areas from IACS (Farmer's applications for crop subsidies).

** Seeds**

Results for seeds (areas, yields per hectare and total production) are compiled for about 20 types. Yield is measured in purified quantity. The statistics are based on data from Tystoftefonden on crop land (administrative information) and production (yield estimates). Seeds are used for the calculation of BFI for agriculture.

2.2 Classification system

Geographical breakdown

The harvest of cereals etc. is divided by Agricultural provinces.

Crops

All crops follow the EU classifications in "Eurostat Handbook for Annual Crop Statistics".

2.3 Sector coverage

The agricultural sector.

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2.4 Statistical concepts and definitions

Area for application : Agricultural areas comprised by application for direct support to the Agency of Agriculture. Each area specifies a crop.

Mixed crops: Mixture of crops sown in the same field, eg. of cereals and/or legumes.

Area under cultivation : Agricultural areas where a given crop is cultivated. The crop will most often correspond to that specified in the area for application, but may differ as a result of a changed cultivation plan.

Aftermath: Harvesting of small crops (grass or clover, etc.) in fields where the same or another crop has previously been harvested. The area is also included under the first crop (typically grain).

Ensiling: Method for preserving fodder from whole grains, grass or other green fodder.

Fodder unit : Measure of energy content in crops that can be used for fodder.

Coarse fodder: Fodder crops used more or less unprocessed for fibrous fodder. Includes Whole crop, maize for green fodder, grass, fodder turnips etc.

Straw yield : The amount of straw, calculated from the yield of the individual crops.

Whole crop/silage: Crops where the whole plant is harvested green and used for feed. Wholecrop is cut and preserved as silage or used directly.

Yield, kernel : Harvest of grain, measured by weight of the kernel.

Maize for green fodder: Maize that is harvested as a whole crop before ripening and usually ensiled for fodder.

Grain maize: Maize grown for ripening of cobs and kernels in September-October. Used for fodder.

Rotation: Alternating crops. Characteristic of areas in rotation is that tillage is harvested and carried out (plowed/harrowed). If an area is not harvested or tilled for five seasons, it is considered "permanent" (eg. grass).

Dry weight : The yield of cereals, etc. is indicated in dry weight (standard humidity). Dry weight means a water content of not more than 15 percent for cereals/peas/beans and no more than 9 percent for rape.

Winter crops : Crops harvested in autumn and harvested the following summer. Includes winter wheat, rye, triticale, winter barley and winter rape.

Spring crops : Crops that are sown in spring and harvested the same summer. Includes spring wheat, spring barley, oats and mixed seeds, corn cobs and spring rape.

Organic crops : Crops grown according to organic principles set by Danish authorities.

2.5 Statistical unit

- Area (1000 hectare)
- Average yield (100 kg pr hectare)
- Production (million kilos)

2.6 Statistical population

The target population are farmers with production of the covered crops (cereals, canola, pulses, fodder crops).

2.7 Reference area

Denmark.

2.8 Time coverage

The statistics in their present form are generaly available from 1990. However, see 'Comparability over time' for specification.

2.9 Base period

The statistics cover harvest in the calendar year.

2.10 Unit of measure

- Land: 1000 hectare.
- Average yield: hectokilo per. hectare. 1 hkg = 100 kg.
- Production: million kilo.

2.11 Reference period

The statistics cover harvest in the calendar year.

The harvest of cereals, rape etc.

The end of the harvest each year (typically in early September). In practice most crops are harvested by the end of September. However, grain maize and corn cob mix have often later harvest in November.

Harvest of roughage

30 Nov. in the reference year of the statistics.

The end of the harvest each year (typically medio November). In practice, most crops are harvested by the end of September. However, Grain maize and corn cob mix have often later harvest in November.

Areas planted with winter crops

The harvest period for the year to which the statistics refer. Data is collected the year before.

This date is usually the latest possible time of sowing.

2.12 Frequency of dissemination

The statistics are published annually.

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2.13 Legal acts and other agreements

The Act on Statistics Denmark, corresponding to request in EU regulation on crop statistics, including forecasts.

Council Regulation 543/2009 relating to crop statistics and forecasts. Directive 1989/130 relating to production of straw incorporated in the Economic Accounts for Agriculture.

2.14 Cost and burden

1.1 man-years.

2.15 Comment

Additional information can be obtained from Statistics Denmark.

3 Statistical processing

Data for the harvest of grains, rape etc. is collected annually from farmers using questionnaires. The collected data is corrected based on consistency rules and yield limits. Corrected data is raised to the total population. Harvesting of roughage, Forecast for winter seed and Seed for seedling are collected annually from experts via questionnaires and the accounts statistics for agriculture. The collected yields are raised by total areas (application for crop subsidies).

3.1 Source data

In general areas are obtained from the Integrated Administration and Control System (IACS) by the Danish Veterinary and Food Administration, supplemented by Statistics Denmark's Agricultural and horticultural survey.

The harvest of cereals, rape and peas and straw

- Questionnaire Based.
- Gross sample of about 2,800 farms (about 8 per cent of all farms). Net Sample: about 2,700 farms.
- Random, stratified sampling.

Harvest of roughage

For areas the source is IACS whereas for yields per hectare source are SEGES, Danish association of sugar beets farmers and the accounts statistics for agriculture. The accounts statistics for agriculture are available with a delay of one year, and for this reason the yields per hectare are updated with the development in crops where recent figures are available where for each fodder crop a crop is selected with a high correlation.

Fodder beets are updated with the development for sugar beets Maize for fodder is updated with the development for grain maize Green harvested cereals, luzerne and aftermath for cereals are updated with the development for spring barley Grass is updated with the development for cereals, total

Example: Grain maize has a yield of 60 hkg per ha in 2018 and 75 in 2019. From the accounts statistics on agriculture we know that maize for fodder has a yield of 320 hkg per ha. For 2019 the yield is thus estimated to 320*(75/60)=400.

The forecast for winter crops

Seed information from the Danish Veterinary and Food Administration and from the Knowledge Centre for Agriculture.

Seed

Information from the Danish Veterinary and Food Administration.

3.2 Frequency of data collection

Annual.

3.3 Data collection

The survey of harvest of cereals etc. is collected annually from farmers using a web questionnaire. Sampling: random, stratified selection.

- Questionnaire and instructions for the Harvest of grain, rapeseed and leguminous seed

Harvest of forage, the forecast for winter seed and seeds are collected annually from SEGES, Danish Sugar Beet Growers and the accounting statistics for agriculture and experts.

3.4 Data validation

The submitted forms to the 'Harvest of cereals etc.' are validated against deviation from average yields.

3.5 Data compilation

Estimation of average yields on grain, rapeseed and leguminous seed

Average yield is estimated at different levels (composed of agricultural share, size, ecology). In each "stratum" the first estimate calculated on at least 5 observations is used. This means in some cases that smaller groups must "share" the average yield for safety reasons. In practice, this means that at regional level, many average yields will be the same, namely the national level.

Humitidy degree

The production of crops and straw is calculated according to standardized humitidy degree. These are based on optimal, average values for the individual crops at harvest, estimated by SEGES and other experts.

In the study of the harvest of grain, rapeseed and leguminous seed, the individual farm indicates the humitidy degree if it deviates from the standard, and production/yield is converted proportionally. For other crops, agricultural consultants state if the year's harvest deviates from the standard percentage.

Standard humitidy degree used

- Cereals, field peas and other pulses: 15 per cent.
- Rapeseed: 9 per cent.
- Grass and clover in the rotation: 50 per cent.
- Lucerne: 40 per cent.
- Maize for silage etc.: 45 per cent
- Grain for silage etc.: 17 per cent.

No corrections are made to humidity percentages for roughage.

Straw

The total harvest yield by weight is converted to straw yield using standard factors. Straw is incl. standard water content (see percentages above).

Conversion factors from kernel yield (kg) to straw yield (kg)

- Winter wheat: 0.55
- Spring wheat: 0.50
- Rye: 0.80
- Triticale: 0.80
- Winter barley: 0.55
- Spring barley: 0.55
- Oats: 0.60
- Mixed semen: 0.60
- Winter rape incl. non-food: 0.90
- Spring rape rape incl. non-food: 0.90
- Field peas: 0.50
- Leguminous seed in total: 0.50

Source: "Håndbog for driftsplanlægning" (Handbook for operational planning).

Water percentage is not calculated for straw.

3.6 Adjustment

No further corrections of data in addition to what has already been described in 'Data validation' and 'Data processing'.

4 Relevance

The users are mainly EU and agricultural organizations. The results are included in the agricultural gross factor income. Information on the use of straw for fuel is used, among other things by the DEA.

User needs are covered in the User Committee for food statistics. Statistics Denmark is also in regular contact with key users, including the Ministry of Food and research institutions.

4.1 User Needs

The most important users are the EU and agricultural organisations. The data on production are also used in compiling the Economic Accounts for Agriculture (EAA). The use of straw for fuel is used by, e.g. the Danish Energy Agency.

4.2 User Satisfaction

User needs are covered in the User Committee for Food statistics. Statistics Denmark is also in regular contact with key users, including the Ministry of Food and research institutions.

4.3 Data completeness rate

Data comply with EU regulations and guidelines.

5 Accuracy and reliability

The response rate for the calculation of the harvest of grains, rapeseed etc. is over 95 per cent. Precision meets EU quality requirements.

For coarse fodder, reliability must be considered reasonable for average yields, while it is high for area information.

The forecast for winter seed areas usually deviates by 5-10 percentage points from the later established cultivated areas.

5.1 Overall accuracy

The overall accuracy in the survey of the harvest of grain, peas and rape can be described as good. However, there is some uncertainty for crops grown in small regions at national level, particularly with regard to spring rape.

For coarse fodder and root crops, reliability must be considered reasonable for average yields, while it is high for area information.

The reliability of the forecast for winter areas must generally be described as less good than the harvest survey.

5.2 Sampling error

The harvest of cereals, rape and peas and pulses

Sample of approximately 2,800 farms (about 8 per cent of all farms). The response rate in the survey is generally over 95 per cent, and does not raise significant uncertainty.

The coefficient of variance of the total harvest of cereals, rape and pulses is about 0.3 per cent., corresponding to about 30,000 tons. grain. For crops with limited distribution, the uncertainty is typically up to 5 per cent.

The statistical uncertainty meets the quality requirement in EU act on harvest statistics.

Because of greater spread in the use of straw than in crop yields, the uncertainty of straw use for different purposes is relatively larger than the uncertainty harvest of cereals, rape and peas.

Harvest of coarse fodder

The response rate in the study of forage harvest is somewhat smaller than 100 per cent., which is a source of uncertainty.

Areas planted with winter crops

No sampling errors as such. The ratio of the areas in the forecast and recent areas recorded indicates an uncertainty of the order of 5 per cent of the total areas with winter seed.

Coefficient of variance (CV) for the main variable in 2017

The harvest of cereals, rape and peas and pulses

Production

- Total cereals 0.3
- Winter wheat 0.3
- Spring wheat 1.6
- Rye 0.9
- Triticale 2.2
- Winter barley 0.6
- Spring barley 0.4
- Grain maize and corn cob mix 4.4
- Oats and mixed grain total of 1.3
- Havre 1.3
- Mixed grain 4.7
- Rape, total 0.6
- Winter rape 0.6
- Spring rape 14.3
- Pulses 4.6
- Field peas 4.6

5.3 Non-sampling error

Applications for EU support are the base for the study of the harvest of grain, etc. Since only a small proportion of farmers have production without EU support the coverage of the target population is assumed to be accurate.

5.4 Quality management

Statistics Denmark follows the recommendations on organisation and management of quality given in the Code of Practice for European Statistics (CoP) and the implementation guidelines given in the Quality Assurance Framework of the European Statistical System (QAF). A Working Group on Quality and a central quality assurance function have been established to continuously carry through control of products and processes.

5.5 Quality assurance

Statistics Denmark follows the principles in the Code of Practice for European Statistics (CoP) and uses the Quality Assurance Framework of the European Statistical System (QAF) for the implementation of the principles. This involves continuous decentralized and central control of products and processes based on documentation following international standards. The central quality assurance function reports to the Working Group on Quality. Reports include suggestions for improvement that are assessed, decided and subsequently implemented.

5.6 Quality assessment

The overall accuracy in the survey of the harvest of grain, peas and rape can be described as good. However, there is some uncertainty for crops grown in small regions at national level, particularly with regard to spring rape.

For coarse fodder, reliability must be considered reasonable for average yields, while it is high for area information.

The reliability of the forecast for winter areas must generally be described as less good than the harvest survey.

5.7 Data revision - policy

Statistics Denmark revises published figures in accordance with the Revision Policy for Statistics Denmark. The common procedures and principles of the Revision Policy are for some statistics supplemented by a specific revision practice.

5.8 Data revision practice

Provisional results for harvest of cereals, pulses and rape seed are in line with final results published later on.

Other results are only prepared once every year, and consequently provisional and final figures cannot be distinguished.

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6 Timeliness and punctuality

The statistics are usually published without delay to the scheduled date.

Preliminary data for the harvest of cereals, rape and pulses are published in late November. Final statement, including results for provinces and regions are published April of the following year, where the coarse fodder harvest alsot is published. End of reference Period: October 1. Harvesting of roughage is published April of the following year. End of reference Period: end of November. The forecast for the following year's winter land released in early December. End of reference Period: October 15

6.1 Timeliness and time lag - final results

The statistics are published annually.

Provisional figures for the harvest of cereals, rape and pulses are published at the end of November. Final figures are available in April of the following year, together with the statistics on the harvest of roughage.

The forecast for areas with winter seeds of the following year appear at the beginning of December.

Data on seeds for sowing appear in Statistics Denmark's Statbank.

6.2 Punctuality

The statistics are usually published as scheduled.

7 Comparability

Similar statistics are produced among EU members and are available from the Eurostat's website. The statistics comply with EU standards.

Harvest figures are in principle comparable back to 1900 but with methodological changes along the way. The current calculation method has in principle been used since 1971. The statistics for the new regions of the country are made from 2006. Thus there for 2006 is both a statement of the then counties, and the current regions.

7.1 Comparability - geographical

Similar statistics are produced among EU members and are available from the Eurostat's website. The statistics comply with EU standards.

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7.2 Comparability over time

The final figures on crop yields are, in principle, comparable as far back as 1900. Changes in methodology must be taken into account, but the present compilation method has been used since 1971. The results on crop yields at regional level are only comparable as from 2006 due to a new administrative structure of regions in Denmark. For 2006, results are compiled on the basis of the former counties as well as the present regions. Figures on coarse fodder are fully comparable as from 1982 and onwards. The change in methodology, which applied for the 2001 survey to the 2002 survey (taking specific account of organic production) as well as the change in the basis of areas (from 2005) may, to a minor extent, have an impact on the data comparability.

Until 2021, the statistics have converted the total harvest yield by weight into 'feed units'. Conversion factors from kernel yield (kg) to feed units (FE): Winter wheat: 1.0241; Spring wheat: 1.0241; Rye: 1.0000; Triticale: 1.0000; Winter barley: 0.9551; Spring barley: 0.9551; Oats: 0.7944; Mixed seed: 0.7944; non-food: 1.7037; Field peas: 1.0897.

7.3 Coherence - cross domain

Similar statistics are produced among EU members and are available from the Eurostat's website. The statistics comply with EU standards.

The forecast for areas with winter seeds can be compared with the later results according to the Agricultural and Horticultural Survey.

7.4 Coherence - internal

Data is internally consistent, deriving from the same source.

8 Accessibility and clarity

The statistics are published in the StatBank under Crop production and in a Danish press release.

8.1 Release calendar

The publication date appears in the release calendar. The date is confirmed in the weeks before.

8.3 User access

Statistics are always published at 8:00 a.m. at the day announced in the release calendar. No one outside of Statistics Denmark can access the statistics before they are published.

8.2 Release calendar access

The Release Calender can be accessed on our English website: Release Calender.

8.4 News release

The statistics are published in a Danish press release.

8.5 Publications

Publications only in Danish.

8.6 On-line database

The statistics are published in the StatBank in the following tables:

- FRO: Grass seed production by crop, unit and time
- HST5: Forecast on winter crop products for harvest by crop, unit and time
- HST77: Harvest by region, crop, unit and time
- HALM1: Straw yield and use by region, crop, unit, use and time

8.7 Micro-data access

Researchers and other analysts from authorized research institutions, can be granted access to the underlying micro-data by contacting Research Services.

8.8 Other

These statistics are available through Eurostat's statistical database.

8.9 Confidentiality - policy

Data Confidentiality Policy for Statistics Denmark.

8.10 Confidentiality - data treatment

The statistics are not published on a level that requires confidentialisation.

8.11 Documentation on methodology

Not relevant for these statistics.

8.12 Quality documentation

Results from the quality evaluation of products and selected processes are available in detail for each statistics and in summary reports for the Working Group on Quality.

9 Contact

The administrative placement of these statistics is in the division of Food Industries. The contact person is Martin Lundø, tel.: + 45 5146 1512, and e-mail: MLU@dst.dk.