

3 Sampling and grossing-up methodology

3.1 Population and sample

The population for Integrated Farm Survey 2023 is based on the Farm Register (46 525 active agricultural holdings); it was developed using threshold values (see the definition of the agricultural holding in the chapter Introduction).

In total 33 745 units out of these active units were involved in the sample. These units cover 99.4% of the utilised agricultural area and 98.6% of the Livestock units (LSU) in total.

The sample was defined as stratified random sample from the population based on affiliation of each unit to defined grossing-up group (stratum). Certain sampling rates for all the units in the group (stratum) within the population were assigned to each stratum. Units with sampling rate under 100% were generated from the population using random number generator without replication. Random number generator program SAS Enterprise Guide 4.2 was used for this purpose.

3.2 Stratification and grossing-up

Reporting units were sorted into strata on the basis of combination of three variables:

- legal form
- size category,
- affiliation with a region according to farm's headquarters or natural person's permanent residence,
- affiliation with an agricultural production area.

Each code of stratum consists of seven-digit chain XAABBCC, where:

- X reaches value 1 for holdings of natural persons or value 2 for holdings of legal persons.
- XX reaches value 11 to 15 or 99 and depends on size of the holding as concerns UAA and/or LSU:

AA	Size category	% of the sample – natural persons	% of the sample – legal persons
11	9,99 ha UAA and less or 1,99 LSU and less	8	15
12	10,00 – 24,99 ha UAA or 2 – 4,99 LSU	10	25
13	25,00 – 49,99 ha UAA or 5 – 9,99 LSU	15	50
14	50,00 – 99,99 ha UAA or 10 – 24,99 LSU	22	50
99	100,00 ha UAA and more	100	100
99	25 LSU and more	100	100
99	40 head of poultry and more	100	100
99	20 head of sheep and more	100	100
99	5 head of goats and more	100	100
99	1,50 ha of vineyards and more	100	100
99	2,00 ha of orchards and more	100	100
99	1,10 ha of vegetables and more	100	100
99	0,30 ha of flowers and more	100	100
99	0,30 ha of strawberries and more	100	100

For this classification to particular size categories reaching any minimum value in category “99” was more important for a concerned unit than its utilised agricultural area or livestock units.

- YY represents abbreviated code of region (NUTS3) and reaches one of the following values: 11, 21, 31, 32, 41, 42, 51, 52, 53, 61, 62, 71, 72, and 81.

- *ZZ indicates affiliation of a unit to agricultural production area:*
 - *Maize area and its subareas 11, 12, 13,*
 - *Sugar beet area and its subareas 21, 22, 23,*
 - *Potato area and its subareas 31, 32,*
 - *Potato-oats area and its subareas 33,*
 - *Mountainous area and its subareas 41, 42.*

Due to insufficient total area in subareas 11, 12, and 13, the units belonging to subareas 12 and 13 were attached to subarea 11. Similarly, subarea code 42 was replaced by code 41. Therefore only codes 11, 21, 22, 23, 31, 32, 33 and 41 were allowed.

Number of grossing-up strata constructed using this way results in 928 combinations, although the theoretical maximum of combinations is 1120 (2 x 5 x 14 x 2). This classification was employed only in sample generating (keeping the proportionality among regions) and in final aggregation by region. Only AACC code, i.e. maximum 40 grossing-up strata, was used in final grossing-up to the population level.

NON-RESPONSE TREATMENT

Incomplete (partially) completed questionnaires had to be retrieved by the control system and manually completed by individual assessment before the calculation procedure:

- (a) similar reporting units within a stratum shall be assigned the averaged values for the holding in that stratum
- (b) for a reporting unit reporting extremes, the last known data are imputed.

GROSSING-UP PROCEDURE

Weights for particular strata were calculated according to formula:

$$W_h = \frac{N_h}{n_h}; \text{ where:}$$

W_h *weighting coefficient for stratum h;*

N_h *number of units in the population generated from Farm Register in stratum h;*

n_h *number of units in a sample in stratum h.*

The output of the grossing-up procedure is an aggregated dataset derived from the dataset whose records consist of aggregates for particular grossing-up groups.

Note: During calculation of relative standard errors, 1 718 units showing extreme values were identified; their weighting factor had to be changed to 1 and these units were moved to stratum of 100%.

3.3 Output tables

Published tables contain summarized grossed-up results for the population (the whole agricultural sector in the Czech Republic) and for agricultural holdings having together at least 98% of utilised agricultural area or at least 98% of livestock units.

The results were calculated using non-rounded values (with 6 decimal places). Therefore summary totals in the tables not always equal to the sum of their sub-items which are published in a rounded form.

