

Survey on the pigs livestock

TYPE

Sample Survey. The sampling method used is the single stratified random sampling. The livestock holdings with pigs that are included in the survey are stratified as follows:

- By region - NUTS II
- By size class of the holdings. In each geographical region, the holdings are stratified into $L = 12$ size classes, according to their size, determined by their number of pigs in the updated livestock holding register, as follows.

Size Class	Number of pigs
Class 1	1 - 2
Class 2	3 - 9
Class 3	10 - 19
Class 4	20 - 29
Class 5	30 - 49
Class 6	50 - 99
Class 7	100 - 199
Class 8	200 - 399
Class 9	400 - 999
Class 10	1000 - 1999
Class 11	2000 - 4999
Class 12	5000 +

Livestock holdings with pigs belonging to classes 9 - 12 were surveyed exhaustively.

The sampling fraction for livestock holdings with pigs is about 2.3%.

The sampling error for the estimation of livestock holdings with pigs measures less than 2% for the whole country.

Estimation of the survey characteristics

a. Symbols

Defining with index i the selection order of a livestock holding with pigs from the sampling frame in the stratum h (stratum=geography x size class) and symbolizing with y one of the survey characteristics, we can define the following:

y_{hi} : the value of the survey characteristic y of the livestock holding with pigs of order i in the stratum h

Y_h : the sum of the values of the characteristic y of all livestock holdings with pigs falling into the survey and belonging to stratum h

Y : the sum of the values of the characteristic y of all livestock

holdings with pigs under the survey. That is: $Y = \sum_h Y_h$

N_h : the number of all livestock holdings with pigs falling into the survey and

belonging to stratum h

n_h : the initial sample size in the stratum h

m_h : the number of respondent units in the stratum h

r_h : the response rate in stratum h ($r_h = \frac{m_h}{n_h}$)

w_{hi} : the extrapolation factor of the livestock holding with pigs of order i belonging to stratum h . That is: $w_{hi} = 1/(\text{Probability of selected unit } i \text{ in stratum } h)$

$$r_h^{-1} = \frac{N_h}{n_h} \cdot \frac{n_h}{m_h} = \frac{N_h}{m_h}$$

b. Estimation process

The estimations of the magnitudes Y_h and Y come from the following relations:

$$\hat{Y}_h = \sum_{i=1}^{m_h} w_{hi} \cdot y_{hi}$$

$$\hat{Y} = \sum_h \hat{Y}_h = \sum_h \sum_i w_{hi} \cdot y_{hi}$$

The variance estimation of \hat{Y}_h and \hat{Y} is given by:

$$V(\hat{Y}_h) = \frac{N_h(N_h - m_h)}{m_h} S_h^2, \text{ where}$$

$$S_h^2 = \frac{1}{m_h - 1} \left[\sum_{i=1}^{m_h} y_{hi}^2 - \frac{\left(\sum_{i=1}^{m_h} y_{hi} \right)^2}{m_h} \right], \quad V(\hat{Y}) = \sum_h V(\hat{Y}_h)$$

The coefficient of variation (%) of total estimation \hat{Y} is given by:

$$CV(\hat{Y}) = \frac{\sqrt{V(\hat{Y})}}{\hat{Y}} * 100$$