ACCEPTANCE SAMPLING IN STATISTICAL QUALITY CONTROL

D. Krapavickaitė

Lithuanian Statistical Society, Lithuania
e-mail: danute.krapavickaite@gmail.com

Abstract

A company receives a shipment consisting of the product lots from the producer. The products should be of the settled quality. Nevertheless the receiver has to ascertain this. In order to check the quality of the product lots, the sample of the products is selected and some quality characteristic is measured. Depending on the results of the quality control the lot is accepted or rejected. This stage of the quality control (Montgomery, 2013) is not aimed at the quality improvement, it is used just for the decision making on the lot acceptance.

The aim of a control for the receiver is to ensure that the lot is rejected with high probability if its quality characteristic reaches a non-admissible threshold. Producer's aim is to have an accepted lot with high probability if the amount of the low quality products in a lot is below the fixed threshold. Quality control of the lot items needs time and expenses. Therefore the problem is to choose the lot product sampling plan and sample size in order to satisfy the interests of both, receiver and producer, with the chosen probabilities of their risks (Schilling et al., 2009). The cost of the quality control for acceptance may be taken into account (Kobilinsky, 2005).

Under the traditional assumptions, the number of the insufficient quality items in a lot is distributed by the binomial distribution. Further study of the problem depends on the kind of the quality characteristic used: it may be an attribute (Tešnjak et al., 2014) or variable with some asymmetric distribution (Shahbaz et al., 2018).

A sequence of specific sampling plans are applied for acceptance sampling. Operating characteristic for a sampling plan which quantifies the sampling risk dependency on the probability of defective products in a lot is usually used.

The acceptance sampling will be presented from the point of view of the survey statistician.

Keywords: receiver, producer, lot, attribute, variable, operating characteristic.

References

Kobilinsky, A.; Bertheau, Y. (2005) Minimum cost acceptance sampling plans for grain control, with applications to GMO detection. *Chemometrics and Intelligent Laboratory Systems*, **75**, 189-200.

Montgomery D. C. (2013). *Statistical Quality Control*, John Wiley & Sons, Singapoure.

Schilling, E. G.; Neubauer D. V. (2009). *Acceptance Sampling in Quality Control*, Chapman & Hall/CRC, Boca Raton.

Shahbaz, A. H.; Khan, K.; Shahbaz, M. Q. (2018). Acceptance sampling plans for finite and infinite lot size under power Lindley distribution. *Symmetry*, **10**, 496, doi:10.3390/sym10100496.

Tešnjak, S.; Banovac, I. (2014). Analysis of attribute acceptance sampling properties. *WSEAS Transactions on Systems*, **13**, 720-729.