

Margin of error of the WelFur fox good health score in the current semi-random sampling method

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The welfare principle Good health in the WelFur on-farm welfare assessment protocol for foxes includes ten measures within the three welfare criteria: (1) absence of injuries: moving difficulties and skin lesions; (2) absence of diseases: bent feet, ocular inflammation, impaired mouth and teeth health, diarrhoea, urinary tract infection, obviously sick fox and mortality; and (3) absence of pain induced by management procedures; killing method. The margins of error (MOE) can be easily calculated for the individual measures for estimating an adequate sample size. The combined effect of these MOEs on the MOE of the Good health principle score is more obscure, because it is aggregated from the measures via several steps and using varying non-linear methods (warning and alarm thresholds, decision tree, l-spline functions and/or Choquet integrals). Our aim is to demonstrate the MOE for the principle score in 22 samples of 120 foxes (the sample size in the current protocol) from a data collected from all 3,697 foxes of one farm. The semi-random sampling method of the protocol was used to take 20 samples. In addition, extreme samples were formed out of the 120 best and worst foxes of the farm. The principle score based on the full farm data was 52, indicating acceptable category (score 20-55), whereas the scores for the 20 semi-random samples ranged from 46 to 73 (mean 54), with six samples in category good (55-80). The score for the best possible scenario, i.e. 100, belonged to the best category (80-100) and the worst scenario, i.e. 28, was above unacceptable level (20). Our demonstration shows that the current semi-random sampling method may lead to a misclassification of a farm in principle Good health. The MOE could probably be narrowed by further developing the sampling method, increasing the sample size or modifying the WelFur score calculation.