

# **Book of Abstracts of the 74<sup>th</sup> Annual Meeting of the European Federation of Animal Science**



**Book of abstracts No. 29 (2023)**

**Lyon, France**

**26 August – 1 September, 2023**

**Evaluation of inter-observer reliability of dichotomous and four-level animal-based indicators**

B. Torsiello<sup>1</sup>, M. Giammarino<sup>2</sup>, L. Battaglini<sup>1</sup>, M. Battini<sup>3</sup>, S. Mattiello<sup>3</sup>, P. Quatto<sup>4</sup> and M. Renna<sup>5</sup>

<sup>1</sup>University of Turin, Dept. of Agricultural, Forest and Food Sciences, Largo P. Braccini 2, 10095 Grugliasco, Italy,

<sup>2</sup>Asl TO3, Veterinary Service, Dept. of Prevention, Via Trento 1, 10045 Piovasasco, Italy, <sup>3</sup>University of Milan, Dept. of Agricultural and Environmental Sciences – Production, Landscape, Agroenergy, Via Celoria 2, 20133 Milano, Italy,

<sup>4</sup>University of Milan-Bicocca, Dept. of Economics, Management and Statistics, Piazza dell'Ateneo Nuovo, 1, 20126 Milano, Italy, <sup>5</sup>University of Turin, Dept. of Veterinary Sciences, Largo P. Braccini 2, 10095 Grugliasco, Italy; benedetta.torsiello@unito.it

This study focuses on the problem of assessing inter-observer reliability (IOR) in the case of dichotomous and four-level animal-based welfare indicators, using and comparing the performance of the agreement indexes available in literature. Udder asymmetry was evaluated as a dichotomous variable in 160 dairy goats by three observers (A, B and C). As four-level variables, Earposture (EP) and Eyewhite (EW) were scored by two observers from 436 photos of dairy cows during the lactating (L) and dry (D) periods. Krippendorff's  $\alpha$ , Fleiss'  $K$  and Quatto's  $S$  were implemented to assess IOR for the dichotomous variable with three observers, while Cohen's  $K$ ,  $K_C$ ,  $K_{PABAK}$ , Krippendorff's  $\alpha$  and Quatto's  $S$  were implemented to assess IOR for the four-level variables with two observers. In the case of the dichotomous variable,  $\alpha$  and Fleiss'  $K$  were affected by the paradox effect: these indexes gave low agreement values despite a high concordance rate ( $P_0$ ) ( $P_{0ABC}=91\%$ ;  $\alpha$ ,  $K=0.44$ ). Similarly, regarding the four-level indicators, in some cases  $K_{PABAK}$  showed the paradoxical behaviour ( $P_{0EWL}=64\%$ ;  $K_{PABAK}=0.29$ ;  $P_{0EWD}=57\%$ ;  $K_{PABAK}=0.14$ ).  $S$  index is suggested to evaluate IOR in the case of dichotomous indicators ( $P_{0ABC}=91\%$ ;  $S=0.83$ ). Cohen's  $K$ ,  $\alpha$  and  $S$  index are suggested to evaluate IOR in the case of four-level variables ( $P_{0EPL}=79\%$ ;  $K$ ,  $\alpha=0.67$ ;  $S=0.73$ ;  $P_{0EPD}=83\%$ ;  $K$ ,  $\alpha=0.73$ ;  $S=0.78$ ;  $P_{0EWL}=64\%$ ;  $K$ ,  $S=0.53$ ;  $\alpha=0.52$ ;  $P_{0EWD}=57\%$ ;  $K$ ,  $\alpha=0.42$ ;  $S=0.43$ ).