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Effects of weight and temperature on defecation index of caged European rabbits

Marco Bagliacca1, Francesco Santilli2, Maria Novella Benvenuti1, Gisella Paci1
1University of Pisa, PISA, Italy
2CAMPIGLIA M.MA LIVORNO, Italy

KEYWORDS: abundance or density; Oryctolagus cuniculus; pellet count

Introduction
Direct and indirect methods are currently used to estimate wild rabbit abundances and population trends. Pellet counts in cleared plots per unit area is a good indirect method to estimate rabbit abundance at small level (protected areas or game farms) as can latrines per unit of distance is a good indirect method to estimate rabbit abundance at larger scales. Nevertheless, to estimate absolute densities, it is necessary to correct for defecation rates and ground pellet persistence. While pellet persistence must be relieved in the field during pellet count, defecation index cannot be relieved during pellet count and a general or bibliographic value is commonly used to estimate absolute densities. However defecation index is influenced by several factors so that general value can lead to biasing, for this reason we studied the effect of the rabbit body weight and the ambient temperature on the defecation index.

Material and methods
The study involved 12 captivity-born adult European rabbits coming from Tuscany (Italy), weighting 1,604-2,512 g. Rabbits were individually caged and fed ad libitum with a commercial pellet (17.4% crude protein, 17.2% crude fiber, 2.6% crude fat, 10.1% ashes, and 40.9% N-free extract) and alfalfa hay; water was also provided ad libitum by nipples. After a period of adaptation to cages the animals were submitted to two different ambient temperature 10°C and 18°C. The total number of faecal pellets dropped per rabbit was measured every day during five non-consecutive days at each temperature. One hundred pellet from each rabbit was used for the dry matter determination. Data collected were submitted to multiple regression analysis to predict the defecation index in relationship to rabbit weight and ambient temperature.

Results
The average weight of the rabbits was 2.02±0.344 (Kg±std.dev); the number of fresh faecal pellets dropped per rabbit in 24h was 293±33.4 (n±std.dev). The weight of fresh faecal pellets dropped per rabbit was 114±20.4 (g±std.dev). The weight of dried faecal pellets dropped per rabbit was 57±4.8 (g±std.dev). Relationship between number of excreted pellet and weight with temperature were: defecation-index number = 317 + 46*weight -10*Temperature (R2Adg=0.82); defecation-index dried-weight = 35,4+ 15,45*weight -1.47*Temperature (R2Adg=0.93).

Discussion
Although data from captive animals are open to objections, these first results can be used to improve rabbit density estimations. Our results show that, to compare data coming from different populations and seasons, the defecation index of the wild rabbit should be adapted to the body weight which characterizes the populations to be censused and the different average temperatures observed during the pellet counting. The weight of dried faecal pellets collected in cleared plots per unit area seems a better parameter than the number to estimate the rabbit population size.
Effects of body weight and environmental temperature on defecation index of caged European rabbits

Bagliacca M.; Santilli F.; Benvenuti N. & Paci G.

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