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Sow rearing in north Italy: I. analysis of technical and productive characteristics of different herds

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RIASSUNTO – Allevamento di scrofe nel Veneto: I. indici tecnico-produttivi in differenti tipologie di allevamento. *Un'indagine effettuata su 17 allevamenti di scrofe ha consentito di raccogliere le informazioni necessarie per valutare i principali indici tecnico-produttivi di tre tipologie di allevamento: a ciclo chiuso e a ciclo aperto con la presenza o meno di lattonzoli in post-svezzamento. Per due anni si sono registrati i consumi alimentari, la composizione dei mangimi, i movimenti dei capi in termini numerici e ponderali. Il numero di parti e il numero di suinetti svezzati sono risultati mediamente pari a 2,47 e 23,9 per scrofa produttiva/anno. I consumi di mangimi sono risultati in media pari a 1185 kg/scrofa/anno a cui si aggiungono 860 kg/scrofa/anno di mangimi per lattonzoli, nelle tipologie in cui essi sono presenti. I risultati forniscono riferimenti utili per la valutazione delle prestazioni di allevamento e sono la premessa per la definizione di bilanci aziendali dell'azoto.*

Key words: sow herds, herd composition, reproductive performance, feed consumption.

INTRODUCTION – There is a lack of information about reference values for the main productive and reproductive indexes for the sow herds in North Italy. This investigation was aimed to collect data from different kind of sow herds placed in the Veneto Region, in order to achieve representative values, in terms of mean and variability, for the main indexes of productivity: herd composition, feed consumption and feed composition.

MATERIAL AND METHODS – Data were collected from 17 commercial herds, with a number of sows ranging from 330 and 2300, distributed in the territory of the Veneto Region and representative of closed herds (5 farms), open herds with post-weaning piglets (9 farms) and open herds selling piglets immediately after weaning (3 farms). From archives of each herd, information from year 2001 to 2003, for a total of 28300 sow present and 690000 piglets produced, were collected. The recorded data were about: herd composition, in terms of number of heads of each category, feed consumption and composition, reproductive events, and the number and the weight of heads bought and sold at different age. Only for closed herds, data about the weight and ages of weaned and post-weaned piglets were established not from direct measurements but from farmer indication. All the farms were visited by an expert operator in order to check the accuracy of the collected data. In order to compare herds of different size, all the data were expressed in term of "productive sow unit", defined as the sow from the first mating to the end of the last lactation. Data were analysed (SAS, 1990) considering 3 different kinds of herds as source of variation.

RESULTS AND CONCLUSIONS – The mean reproductive performance and herd composition are given in table 1. The first two more traditional kind of herds showed values for the percentage of culling and replacement (about 38%) significantly lower ($P<0.01$) with respect to those found for the open herds selling the piglets immediately after weaning (50%). These results are in agreement with those reported by Verstegen (1998), who

indicated that the average annual culling rate in commercial sow herds varies between 35 and 50%. The number of litters annually achieved for sow unit was significantly affected (P<0.05) by the kind of herd and ranged between 2.38 and 2.53, with the lower value for the closed herds. Similarly, the number of weaned piglets per sow ranged from 22.7 to 25.0, but, because of the high residual variability, no difference, due to the kind of herds were observed. Similar values were reported by Whittemore (1993) for UK (22.3 weaned/sow/year), Dourmad *et al.* (1999) for France and The Netherlands (23.3 and 22.5 weaned/sow/year, respectively). Piglets mortality after weaning ranged from 2 to 3%. The mean herd composition, given in table 1, indicated that the total number of sows, including gilts, ranged from 1.17 to 1.25 as respect to the productive sow unit. The values given in table 1 may be used as simple tool to evaluate, with some approximation, the average herd composition by simply counting the number of productive sows present in the farm.

Table 1. Reproductive performance and herd composition in different kind of sow herds.

		Closed herds	Open herds		rsd
			With post-weaning piglets	Without post-weaning piglets	
Herds	n.	5	9	3	
Productive sows units	n./herd	327^{A}	799^{A}	2304^{B}	984
Culling rate	%	38.1^{A}	38.8^{A}	53.0^{B}	7.9
Replacement rate	"	38.1^{A}	37.0^{A}	50.7^{B}	6.6
Farrowing interval	d	154.6	147.1	144.0	8.2
Lactation period	"	23.3^{B}	21.7^{B}	20.0^{A}	1.83
Post-weaning period	"	57	52.7	-	4.9
Reproduction indexes:					
Litters	n./sow unit/year	2.38^{a}	2.49^{ab}	2.53^{b}	0.12
Weaned piglets	"	22.7	24.0	25.0	2.6
Post-weaning piglets	"	21.8	23.3	-	2.4
Mean herd composition:					
Productive sow unit	sow unit	1	1	1	-
gestating sows	%	74.2^{a}	77.6^{ab}	79.2^{b}	3.8
lactating sows	"	15.2	14.7	13.8	1.0
dry sows	"	10.6	7.7	7.0	4.0
Incoming gilts	n./sow unit	0.21	0.14	0.15	0.08
Out coming sows	"	0.04	0.03	0.02	0.02
Present sows	"	1.25	1.17	1.17	0.08
Weaning piglets	"	1.44	1.42	1.37	0.17
Post-weaning piglets	"	3.47	3.39	-	0.34

$^{a, b, c, A, B, C}$ Values on the same line with unlike superscript letters, were significantly different; with small letters (P<0.05), with capital letters (P<0.01).

Differences in the herd composition can reflect different strategies of the incoming gilts and the out coming sows management, as it is evidenced by the different live weights showed in Table 2. The average live weight of weaned piglets ranged from 5.7 to 6.7, with the lower values for the herds selling the piglets immediately after weaning. This was partially due to the shorter lactation period. The amount of feed annually consumed by the productive sow unit was on average 1185 kg, of which about 22, 73 and 5% of feeds for lactation, for gestation and others feeds, respectively. This value is close to that of 1140 kg proposed as default by ERM (1999). In the herds where the post-weaning piglets were kept, an additional average consumption of 860 kg of feed/sow unit was observed. Crude protein content of feeds for lactating and gestating sows were on average of 16.4 and 15.0% as feed, respectively, while that of the feeds used for piglets was on average 18.4%. Similar values were reported also by Dourmad *et al.* (1999) for France and van der Peet-Schwering *et al.* (1999) for The Netherlands. The growth performance of post-weaning piglets, in terms of average daily gain (ADG) and feed

conversion ratio (FCR), respectively 0.415 kg/d and 1.68 kg/kg, were close to the expectations. ERM (1999) proposes for FCR a default value of 1.8 kg/kg, Dourmad *et al.* (1999) reported for France values of 0.43 kg/d and 1.7 kg/kg, respectively for ADG and FCR. In conclusion this work provided, from data collected on commercial farms, some useful indexes about the herd composition and the productive characteristics of sow herds in the Veneto Region. These first information can be useful in the practice not only as reference values, in order to improve the farm strategy of production, but also to the operators called to make economical and environmental balances at farm and territorial level.

Table 2. Live weights, feed consumptions and growth performance in different kind of sow herds.

		Closed herds	Open herds		rsd
			With post-weaning piglets	Without post-weaning piglets	
Live weights:					
Incoming gilts	kg/head	32.4^{a}	59.5^{b}	65.1^{b}	26.7
Out coming sow	"	232^{b}	214^{a}	218^{ab}	15
Weaned piglets	"	6.7^{B}	6.2^{B}	5.7^{A}	0.5
Post weaning piglets	"	30.6^{B}	27.8^{A}	-	2.1
Feed consumptions:					
Lactation feed	kg/sow unit/year	253	288	246	60
Gestation feed	"	856	892	851	94
Other feeds	"	63	50	57	36
Total feeds for sow	"	1172	1230	1154	97
Post weaning feeds	"	887	833	-	139
Total feeds used	"	2060^{B}	2062^{B}	1154^{A}	190
Crude protein content of feeds:					
for lactation	%	16.5	16.4	16.3	0.4
for gestation	"	15.0	15.0	15.0	0.6
others	"	16.9	15.6	16.5	0.2
for piglets	"	18.6	18.3	-	0.4
Post weaning piglets:					
ADG[1]	kg/d	0.42	0.41	-	0.04
FCR[2]	kg/kg	1.70	1.66	-	0.20

$^{a, b, c, A,B,C}$ Values on the same line with unlike superscript letters, were significantly different; with small letters ($P<0.05$), with capital letters ($P<0.01$). [1]Average daily gain. [2]Feed Conversion rate.

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