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# Effect of suckling management on productive performance and carcass traits of Comisana lambs

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**ABSTRACT** - The effect of restricted suckling on productive performance and carcass traits of growing lambs was determined. Twenty-one naturally suckled male Comisana lambs were divided into three equal weight groups with differing suckling management systems: 1) only maternal milk (C); 2) only maternal milk until 15 d of age and, from 16 d of age to slaughter, maternal milk, concentrate and hay *ad libitum* (T1); 3) only maternal milk until 15 d of age and, from 16 d to 30 d of age, maternal milk, concentrate and hay *ad libitum*, and, from 31 d of age to slaughter, only concentrate and hay *ad libitum* (T2). Average daily weight gain (ADG) and milk and feed intake were calculated. Ewe milk was collected from each group. At slaughter (63 d) live weight and carcass measurements were recorded. The overall mean of total milk collected was 22.7 and 41.6 kg ewe<sup>-1</sup> for T1 and T2, respectively. Suckling management system significantly affected ADG, milk intake, dressing percentage, and percentages of intestines, stomachs, offals, and kidney fat. Suckling management appears to be an important factor affecting lamb growth and carcass quality.

*Key words:* Comisana lamb, Suckling management, Productive performance, Carcass traits.

**Introduction** - Suckling lamb meat is a typical product of the Mediterranean area. In Mediterranean countries the slaughter of lambs of dairy breeds is not over the age of 65 days with carcasses weighing less than 13 kg (Russo *et al.*, 2003). Early weaning period is a critical point for good health, productive performance and general management practices of lambs (Napolitano *et al.*, 2002). The aim of the present study was to evaluate the effect of suckling management on productive performance and carcass traits of Comisana lambs.

**Material and methods** - The trial was carried out on 21 Comisana suckling ram lambs, born as singles in mid October, from 3-year-old dams of the same weight (50±1.5 kg) reared indoors. All lambs received only maternal milk until 15 d of age. After day 15, the animals were randomly assigned to one of three treatment groups: continued milk feeding (C); continued milk feeding, only once in the morning, plus concentrate and hay *ad libitum* (T1); continued milk feeding, only once in the morning, plus concentrate and Lucerne hay *ad libitum* until 30<sup>th</sup> day of age, and from 31<sup>st</sup> exclusively with concentrate and Lucerne hay *ad libitum* (T2). To evaluate milk consumption, lambs were individually weighed before and after each suckling bout every week (from 0 to 9). To calculate the average daily weight gain, lambs were individually weighed at the birth, at 15 and 30 day of age (in the morning after an overnight fast), and at slaughter. Average feed consumption for T1 and T2 experimental groups was calculated. Ewe milk was collected from 16 to 62 days of the experiment from the T1 and T2 groups and was measured. Lambs were slaughtered (ASPA, 1991) at 63 d of age, after an overnight fast. Hot and cold carcass weights (with head and offal) were recorded and dressing percentages were

calculated, after dressing and chilling at 2 to 4°C for 24 h, considering the empty body weight (EBW: bodyweight of animal excluding weight of contents gastrointestinal tract). Empty gastrointestinal organs (stomach and intestine) were weighed and expressed as percentage of EBW. Carcass shrink losses, calculated as the difference between hot and cold carcass weights, were expressed as a percentage of hot carcass weight. After the refrigeration period (24 h at 2 to 4°C), internal organs (lungs, trachea, heart, liver, spleen), and kidney fat were removed, weighted and expressed as percentages of cold carcass weight. Data were evaluated by the analysis of variance by ANOVA (SPSS, 2006). Differences among means were determined using the Scheffe's test.

**Results and conclusions** - The overall mean of total milk collected was 22.7 and 41.6 kg ewe<sup>-1</sup> for T1 and T2, respectively. **Growth performance, milk intakes and slaughter performances are reported in table 1.** The restricted suckling did not significantly affect slaughter weight. Nevertheless, compared

Table 1. Effects of management on lamb growth performance, milk intakes and slaughter performances.

Group <sup>A</sup>	C	T1	T2	SEM	P value
Initial live weight, kg	4.88	4.76	4.88	0.16	0.957
Slaughter weight, kg	19.58	19.25	16.84	0.51	0.296
ADG, g·d <sup>-1</sup>					
Day 0-15	250	250	252	11.1	0.997
Day 16-30	243a	174b	166b	13.2	0.012
Day 31 to slaughter	211	256	172	14.7	0.064
Milk intake, kg d <sup>-1</sup>					
Day 0-15	1.16	1.09	1.18	0.05	0.720
Day 16-30	1.18a	0.90	0.84b	0.06	0.027
Day 31-62	1.08A	0.56B	-	0.09	0.002
Empty body weight, kg	18.16	18.49	15.54	0.71	0.178
Hot carcass weight <sup>B</sup> , kg	12.84	12.53	10.47	0.53	0.190
Cold carcass weight <sup>B</sup> , kg	12.32	12.05	10.04	0.52	0.120
Empty intestines tract <sup>C</sup> , %	5.08a	6.96b	7.24b	0.34	0.002
Empty stomach <sup>C</sup> , %	2.40a	3.37b	4.34c	0.22	0.014
Hot dressing <sup>C</sup> , %	70.70a	67.53b	66.97b	0.77	0.033
Cold dressing <sup>C</sup> , %	67.67a	65.06b	64.54b	0.75	0.024
Internal organs <sup>DE</sup> , %	6.52a	8.33b	8.22b	0.33	0.012
Kidney fat <sup>D</sup> , %	1.96a	1.27b	0.54c	0.16	0.026
Carcass shrink losses <sup>F</sup> , %	4.31	3.89	4.29	0.16	0.224

a, b = P < 0.05; A, B: P < 0.01. <sup>A</sup> C = continued milk feeding; T1 = continued milk feeding, only once in the morning, plus concentrate and Lucerne hay ad libitum; T2 = continued milk feeding, only once in the morning, plus concentrate and Lucerne hay ad libitum until 30<sup>th</sup> day of age, and from 31<sup>st</sup> exclusively with concentrate and Lucerne hay ad libitum.

<sup>B</sup> With head, kidney, lungs, trachea, heart, liver, spleen and distal thoracic and pelvic limb. <sup>C</sup> Calculated on empty BW.

<sup>D</sup> Calculated on cold carcass weight. <sup>E</sup> Lungs, trachea, heart, liver, spleen. <sup>F</sup> Calculated on hot carcass weight.

to C and T1 lambs, those of T2 group had slightly ( $P=0.09$ ) lower final weight. ADG for C group was higher ( $P<0.05$ ) than T1 (+26%) and T2 (+29%) after 15 d. This could be due to the better utilization of metabolizable energy of maternal milk when the rumen is not yet able to assume and assimilate efficiently solid feed (Jagusch and Mitchell, 1971). In 31-63 d, T1 lambs tended ( $P<0.07$ ) to grow faster than T2. These findings agree with Napolitano *et al.* (2003) and Sevi *et al.* (2003), who suggested that lambs, subjected to a gradual separation from their mothers, exhibited better growth rate.

Milk intake for C group was significantly higher ( $P<0.05$ ) than T2 in 16-30 d and two-fold higher ( $P<0.01$ ) than T1 in 31-62 d. As expected, compared to T1 lambs, those of T2 group had higher intakes of concentrate (437.2 vs. 314.6 g d<sup>-1</sup>) and hay (162.2 vs. 85.8 g d<sup>-1</sup>). A growing increase in concentrate intake has been attributed to the better developed digestive system (Mahgoub *et al.*, 2000). However, the higher concentrate and hay consumption was not enough to bridge the gap in growth rate between the T1 and T2 lambs. Empty body weight, and hot and cold carcass weight were unaffected by suckling management. On the other hand, statistically significant differences among groups for intestine and stomach percentage were observed: percentages of intestine and stomach decreased with milk intake in the diet (intestine: C < T1 and T2,  $P<0.05$ ; stomach C < T1 < T2,  $P<0.05$ ). These effects of different dietary (continued milk feeding and solid feed) have been documented in sheep (Baldwin, 2000). T1 and T2 lambs had a higher ( $P<0.05$ ) percentage of internal organs (lungs, trachea, heart, liver and spleen) than C lambs. Changes in tissue mass of the internal organs of ruminant animals has been previously observed with increased dry matter intake and this has been largely attributed to the concomitant increase in energy intake (Fluharty and McClure, 1997). Expressed as percentage of the empty body weight, there were differences in hot and cold dressing between milk-fed animals compared those fed with solid diets. The higher ( $P<0.05$ ) dressing percentage observed in C lambs (they are essentially monogastric) might be attributed to a lower weight of the gastro intestinal apparatus. The percentage of kidney fat increased with milk intake in the diet, T2 < T1 < C ( $P<0.05$ ). Nutrition is an influencing factor in development of adipose tissue (Wan Zahari *et al.*, 1989). Carcass shrink losses did not differ ( $P>0.05$ ) among experimental groups. Suckling management appears to be an important factor affecting lamb growth, carcass quality and, in addition, milk availability for cheese production.

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