



# Influence of live weight, sex and type of birth on growth and slaughter characteristics in early weaned lambs



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## ABSTRACT

The aim of the present study was to analyze live weight and growth data from birth to a live weight of 24–26 kg in early weaned lambs. The growth in the different age periods was determined on the basis of live weight changes for 152 lambs from the Blackhead Plevan breed. The results showed that the single lambs with a higher live weight at birth grew faster, but for twins there were no differences ( $P > 0.05$ ). The difference in live weight was largely related to sex and type of birth. During the first 14 days of the suckling period the growth of lambs depended mainly on the amount of suckled milk. The male lambs grew faster than females after weaning. The lambs born as twins or singles placed under the same conditions of feeding and management did not differ in daily growth after weaning. Differences in live weight of lambs at birth and at weaning time were apparent until lambs reached 25 kg live weight. Correspondingly, this led to an increase of 5–10 days to reach 25 kg live weight of the lambs weaned at less than 9–11 kg and under 19–21 days, compared with the older lambs or born or lambs weaned at heavier live weights. The live weight from 7 to 11 kg and age from 17 to 28 days of weaning did not affect daily gain after weaning. However, all lambs have relatively low daily gain during the first week after weaning (about 50–60% of expected) and during the second week (about 60–70% of expected gain).

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## 1. Introduction

It is generally accepted that at birth male lambs have higher live weights than females, but there is equivocal opinions about the influence of the sex on the growth rate. According to Daskiran et al. (2010), the weight was higher throughout the whole experimental period (from birth up to 198 days of age) for male lambs versus female born as singles. Idris et al. (2010) pointed

out that the female lambs were born with lower live weight than males, but this had no effect on their growth rates. Similar results were observed by others (Ali et al., 1999; Boujenane and Kansari, 2002). Other researchers (Mavrogenis, 1996; Kumar et al., 2008) have reported that male lambs from different breeds and at any age had higher live weight and better growth performance than females. The reasons for the higher growth rate of male lambs were the sex hormones (Fahmy et al., 1969) and faster skeletal development than in females (Abbas et al., 2010). However, in the experiment of Manso et al. (1996) female lambs were born with lower live weight but after weaning at 37 days of age, they grew faster than males.

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The type of birth has a greater effect on the live weight than the sex of the animals (Todorov, 2008). Savov (1948) and Ivanova and Raicheva (2009) noted that lambs from the Blackhead Plevan Sheep born as singles had higher live weight than twins, not only at birth, but also at weaning at 3 months of age ( $P < 0.01$ ). This could be explained with the competition for milk during the suckling period of twins (Cloete et al., 2007). According to Mavrogenis (1996) live weight, sex and type of birth influence the growth only before weaning and placing lambs under the same rearing conditions leads to equal growth rates. As it can be seen there is no unified opinion on the influence of sex and type of birth on the growth when the lambs are reared under equal conditions after weaning. Also, at this point, there are no experiments with very early weaned lambs.

The aim of this study was to examine the impact of live weight at birth and weaning, and the sex and the type of birth on the growth of lambs weaned between 17 and 28 days of age and reared under the same feeding and management conditions.

## 2. Materials and methods

The experiment was conducted with a total of 152 lambs from the Blackhead Plevan Sheep breed. The lambs suckled the total quantity of milk from their mothers until 15 days of age (range from 13 to 21), then for several days they were partially deprived of the mother's milk by suckling only during a definite part of the day and then they were weaned completely at 17–28 days of age.

The live weight (LW) of lambs was measured at birth, at the onset of partial deprivation from the mother's milk, daily during the milk deprivation period, at full weaning, at every other day until 12 days after the complete weaning, and at 7-day intervals until reaching a LW of 25 kg. The LW was measured without depriving the animals of food and water was applied with exception only at the end of the experiments (25 kg LW) when the lambs were kept 12 h without water and 24 h without food.

The slaughter analyses have been made according to Zahariev and Pinkas (1979) and the evaluation of carcasses by the (S)EUROP system (Raicheva and Marinova, 2002), after storage for 24 h at 4 °C.

**Table 1**

Correlation coefficients ( $r$ ) between live weight (LW) at birth and average daily gain.

Birth to 14th day	$r$	Birth to 25 kg LW	$r$
Single ( $n = 77$ )	0.069	Single ( $n = 77$ )	0.253*
Twins ( $n = 75$ )	0.276*	Twins ( $n = 75$ )	0.274*
Male ( $n = 80$ )	0.251*	Male ( $n = 80$ )	0.464**
Female ( $n = 72$ )	0.322**	Female ( $n = 72$ )	0.231*

\* Correlation is significant at 0.05 level.

\*\* Correlation is significant at 0.01 level.

The data were analyzed for the correlations by Pearson's were done by the software Statistica for Windows (2006). Group were compared using  $t$ -test, and differences at  $P < 0.01$  and  $P < 0.05$  were considered significant.

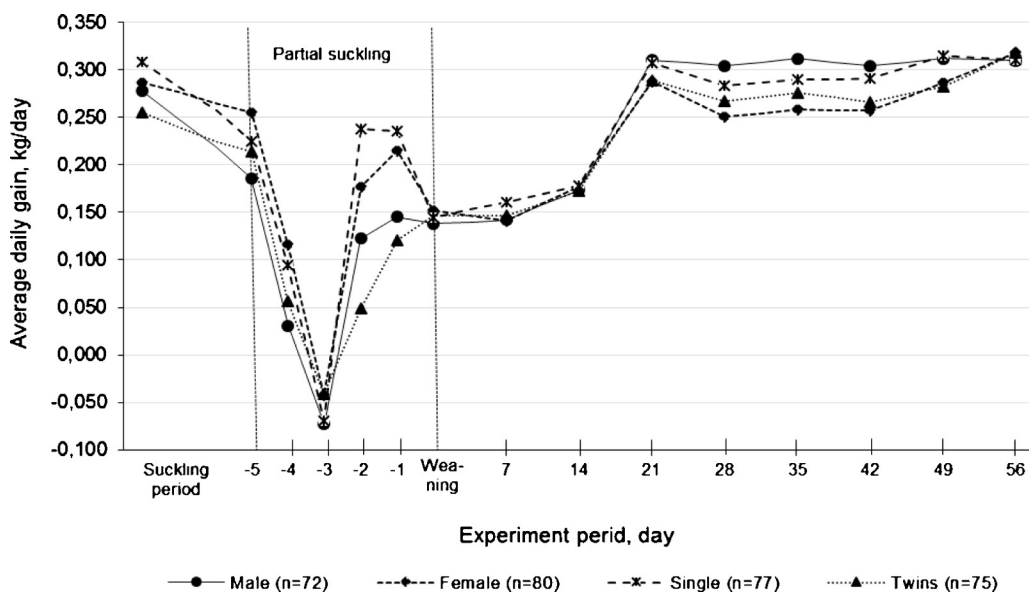
## 3. Results

### 3.1. Effect of live weight at birth on growth of lambs

During the suckling period, there was a correlation between LW at birth and average daily gain (ADG), except for the lambs born as singles (Table 1). The data show that correlation was significant for both sexes. Tracing the growth of the lambs to 25 kg LW, the correlation was significant and relatively higher in male lambs ( $r = 0.464$ ,  $P < 0.01$ , Table 1).

### 3.2. Influence of live weight at weaning on the growth of lambs

During the partial deprivation of milk, all the lambs had decreased ADG up to the third day, after which ADG started to increase (Fig. 1). After complete weaning, the lambs weaned less than 9 kg and over 9 kg LW began to grow equally (Table 2). Growth during the suckling period was lower in lambs which failed to double their weight at weaning ( $P < 0.05$ , Table 2). They reduced their LW during



**Fig. 1.** The growth of lambs of different sex and type of birth.

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