

EFFECT OF THE INCORPORATION OF THE LIVE YEAST (*Saccharomyces cerevisiae*) (LEVUCCELL Sc 10. ME) IN THE FEED CONCENTRATE ON GROWTH PERFORMANCE OF LAMBS BLACK THIBAR

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The effect of yeast incorporated *Saccharomyces cerevisiae* (LEVUCCELL Sc 10. ME) at different doses in concentrated feed on growth performance of lambs of the Black Thibar breed was studied. Forty-five (45) lambs were divided into three homogeneous groups for live body weight (17.08 ± 2.49 kg) and for age (147 ± 12 days). Lambs were fed a basic ration of oat hay *ad libitum* and 400 g /lamb/d of concentrate feed during a 78 days trial period. Lambs in each group received food concentrates differing in the amount of yeast. The control group (C), concentrate feed contains no yeast; the group (DR) with concentrated feed contains 0.4 g of yeast and group (DD) in which the food concentrate contains 0.8 g of yeast. The intake of dry matter of the basal diet was 24.4; 22.4 and 22.0 g DM/kg W^{0.75} for groups C, DR and DD respectively. The average live weight was 25.82; 25.92 and 26.06 kg for groups C, DR and DD respectively. The average weight gain was 148.54; 144.3 and 149.67 g/d groups (C), (DR) and (DD) respectively. The consumption index was 4.16; 3.6 and 3.15 kg DM/kg groups (C), (DR) and (DD) respectively. In conclusion, the group (DD) has relatively high performances than the group (DR).

Key words: conversion index, weight, intake, lambs, *Saccharomyces cerevisiae*

The fattening of lambs after weaning is not a common practice in Tunisia. Indeed, the majority of farmers market lambs at relatively low weight (Selmi *et al.*, 2010) and this because of the instability of the surface and forage production, ingredients making food concentrates are generally undiversified and

imported, mineral and vitamin supplementation is not always guaranteed. While the intensive fattening of lambs with balanced rations and high nutritional value remains a source of income desired (Hammami *et al.*, 2007). Moreover, sheep meat is a great economic challenge since their production, consumption and trade they generate condition the life of various occupational categories (Hamrouni *et al.*, 1995). Under such conditions, the search for other food resources would be of great interest to breeders. So much research has been done in recent years in the aim of enhancing various agro-industrial by-products such as olive pomace, citrus pulp and pulp of tomatoes or crop residues of dates and cereals, is the incorporation of food additives with effects of stabilizing ruminal pH and improving digestion. To do this, we wanted to test the effect of a probiotic «*Saccharomyces cerevisiae*» (LEVUCCELL Sc 10. ME) which happens to be ubiquitous and whose effects have proven beneficial for different species and different performance (Pol, 1996, Krehbiel *et al.*, 2003, Desnoyers *et al.*, 2006, Majdoub-Mathlouthi *et al.*, 2009). The objective of this work is to compare the growth performance (weight gain, average daily growth) and the conversion index of lamb's Black Thibar in the presence and absence of the yeast in the concentrate feed with different doses.

MATERIALS AND METHODS

Animals and diets

Forty-five (45) lambs Black Thibar were divided in to three homogeneous groups (15 lambs / lot) according to the average live

weight (average weight = 17.06 ± 2.46 kg; average weight = 17.13 ± 2.53 kg ; average weight = 17.06 ± 2.46 kg for Lot C, Lot DR and Lot DD respectively) and age (average age = 158.26 ± 4.29 d; average age = 145.2 ± 2.9 d; average age = 139.4 ± 2.46 d for Lot C, Lot DR and Lot DD respectively), housed in three boxes of 20 m² each equipped with feeders, racks and troughs, fed a common base of oat hay ad libitum supplemented with

concentrated feed at the rate of two distributed 400 g/lamb/day equal meals at fixed times throughout the test. Lambs of Lot C were fed control concentrated without no yeast, lambs in the lot DR received 0.4 g/lamb/day yeast and lambs in the lot DD received 0.8 g/lamb/day yeast. The chemical composition and nutritional value of different foods in the diet are summarized in the Table: 1.

Table 1: Chemical composition (% DM) and Nutritive value of food concentrate and Oat hay

	% DM	CP	MM	OM	UFL /kg DM	PDIE (g/kg DM)	PDIN (g/kg DM)
Concentrate (C)	88	16.6	8.8	91.2	0.94	111.4	111.4
Concentrate (DR)	89.12	16.4	8.2	91.8	0.92	109.4	110.0
Concentrate (DD)	88.94	16.9	8.0	92.0	0.92	111.4	113.3
Oat hay	90.88	5.0	10.5	89.5	0.32	44.7	53.2

Growth performance

Voluntarily ingested quantities of dry hay were determined daily by the difference between the amount distributed and refused. The lambs were weighed fasting a weekly basis to monitor the weight and determine average daily gain and feed efficiency (FE) which represents the ratio between the amount of food intake and weight gain.

Statistical Analysis

The results of the effects the amount of yeast in food intake focused on the DM basal ration and growth performance of lambs were subjected to analysis of variance by GLM procedure of SAS (1989) and compared by Duncan's test (1955).

Equation model: $Y_{ij} = \mu + R_i + E_{ij}$

Where Y_{ij} : parameter measured; μ : average; R: effect of the regimen and E_{ij} : random residuals

RESULTS AND DISCUSSION

Evolution of DM intake

The evolution of the average amount of dry matter ingested voluntarily is presented in Figure: 1. The average intake was 244; 224 and 220g/lamb/day for Lot C, Lot DR and Lot DD respectively. It was 190; 184 and 180 g/lamb/d for Lot Lot C, Lot DR and Lot DD respectively to control the first week and then it increases with age and weight of lambs to reach a peak around the 9th week (350; 346 and 335 g/lamb/d for Lot C, Lot DR and Lot

DD respectively) no statistical difference between the means ($p > 0.05$). This corroborates the results claimed by Desnoyers *et al.* (2006) and Selmi *et al.* (2010) which showed that the incorporation of yeast in the ration of fattening lambs does not affect the intake of the ration DM basis especially when the latter is hay.

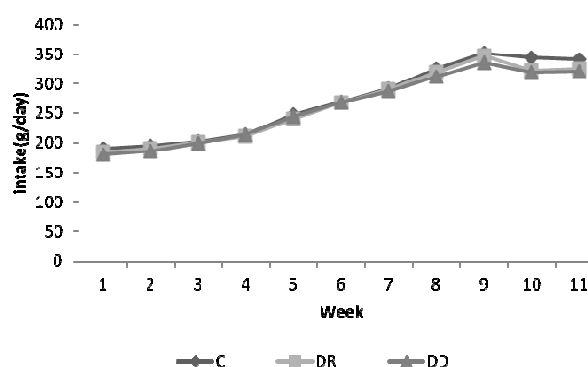


Figure 1: Evolution of ingestion of the basal diet (g DM/day)

Growth performance

The evolution of the live weight of lambs and average daily gain is shown in Table: 2. It appears that lambs fed yeast double dose (DD group) have a superior weight gain with no statistical difference compared to other lots. This weight gain was 8.76; 8.79 and 9 kg respectively for lots C, DR and DD. On average daily gain, they oscillate between a minimum of 83.33, 96.66 and 125g / d and a maximum of 103.7, 166.66 and 185 g / d

respectively for lots C, DR and SD with significant differences between diets. This trend could be attributed to the effect of "*Saccharomyces cerevisiae*" that stimulates the cellulolytic bacteria and rumen lactic acid causing an increase in the number of protozoa in the rumen (Miranda *et al.*, 1996) resulting in an increase the concentration of ammonia nitrogen (NH₃-N) and the stabilization of ruminal pH (Ghorbani *et al.*, 2002) allowing the microbial flora to develop favorably. These features improve the digestion of the fibers and the flow of microbial protein in the rumen.

Table 2: Evolution of the average live weight and average daily gain by complementation

	Weight (kg)		Average daily gain (g/d)	
	initial weight	final weight	Minimum	Maximum
Group C	15.46 ^a	25.83 ^a	83.33 ^a	103.7 ^b
Group DR	14.53 ^a	25.93 ^a	96.66 ^a	166.66 ^a
Group DD	14.86 ^a	26.06 ^a	125 ^a	185 ^a
SME	1.09	2.3	0.8	1.02

^{ab}: Means with different superscripts within a row differ significantly ($p < 0.05$).

The conversion index (CI) which represents the ratio between the amount of total dry matter intake and total weight gain. It is of the order of 4.16; 3.6 and 3.15 kg DM / kg gain, respectively, for the control group and the experimental groups (DR and DD), which results in a power-saving and thus a reduction in charges to the workshop fattening. The conversion index achieved by lambs fed yeast in the concentrate feeder could be attributed to the fact that probiotic increases the growth rate (Frayse and Darré, 1990), which is negatively correlated with the consumption index (Soltner, 1990).

CONCLUSION

Through this study, we can conclude that the addition of live yeast "*Saccharomyces cerevisiae*" resulted in an increase in weight, improved conversion index. However, in order to confirm these results, a series of

additional data should be considered namely the effect of yeast on a high dose carcass quality, and especially the ability to enhance butcher sensory quality of meat.

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