ORIGINAL ARTICLE

Evaluation method of general body condition of livestock sheep by realignment of lumbar regions in the race Rembi in the El Bayadh region

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The production of meat from sheep breeding in the so-called steppe zone is characterized by respectful organoleptic qualities and comes from the diverted rations characteristic of each zone distributed by farmers for their animals. The protein source from the vas deferens of the sheep carcass constitutes an important indicator sought by breeders for years in the area of study to ensure the good quality of meat produced in their farming systems guaranteeing therefore good sales of their livestock based on overall body condition of their animals. One of the most efficient and rapid methods of judging the body condition of the animal is the reshuffle on the lumbar regions. In our research, the main objective was to distinguish the deferent criteria of this quality evaluation in the study area. A total of three samples randomly each containing 45 samples of lumbar regions removed from the carcass showed the most popular place in the market for lamb aged on average 13.6 months, and an average weight of 22.7 gk, good for two years. Our results showed very highly significant values (P<0.05) related to the importance of weight as a classification criterion for strong type carcasses. The study concludes that the food strategy acts as an excellent resource that acts directly on the quality of the meat and the presence of fair quantity of adipose mass explained this values in the choice of the performing races participates in the evaluation of the quality of the meat.

Keywords: Spinous apophysis, Body condition, Lambs, Adipose tissue, Transverse apophysis.

Introduction

In Algeria, local sheep breeds are exploited according to mixed production systems (meat, wool and milk); meat production is traditionally obtained from adult animals, lambs weaned late after more than three months of suckling are finished in fattening workshops and generally slaughtered between 35-40 kg (Benyoucef andal, 1995).

Evaluating the body composition of ruminants has always been a topical issue. The nature of the estimation of the conformation and the state of fattening has led to further investigation into the development of different techniques which would allow the evaluation and consequently the classification of carcasses (INTERBEV-OFIVAL, 2002).

The study of the composition and the structure of the latter is a very important part because it represents the best tool for the evaluation of the meat value of the animals and thus constitutes the basis of the different classification systems which condition the transaction in this area (Bourfia and Echiguer, 1991, Toussaint, 2001).

The economical production of good quality lambs (i.e., fast growing lambs giving carcasses without excess fat), requires rigor in breeding methods and especially rationing (Boquier, et al., 1988; Dudouet, 1997). This is a very delicate operation since the performance of lambs strongly depends not only on the quantity of grass offered but also on its quality (Dudouet, 1997).

The parameters relating to conformation and fattening state are those chosen for their importance in lambs (Colomer Rocher and Kirton, 1975).

It follows that as soon as the lamb reaches a live weight of 30 to 40 kg, it shows a clear tendency to gain fat. The composition of the kg of live weight gain therefore changes during growth; Fat and energy contents steadily increase to the detriment of water (Paquay and Bister, 1987).

The aim of this study is to distinguish the deferent criteria of morphological quality of the lumbar regions of the Algerian sheep breeds (Rumbi) in order to contribute to a better knowledge of the specific protein resources has socio-economic impacts is on the breeding management strategies in steppic environment which remain until now little known and very little studied.

Materials and Methods

Description of animal material

Our study focused on the lumbar regions belonging to the lambs of (Rumbi) breed slaughtered under normal conditions after fattening in the commercial. The studied sampling is based on 135 carcasses of lambs selected from different sites of the study region.

Description of the breed

All the animals are called Rumbi because it is the dominant breed in terms of the number of people in the region, making more than half of the total labour force nationally (Kerbaa, 1995).

The slaughtered animals are lambs at the average age of 13.6 months. In our study all carcasses belong to whole lambs raised and fattened to be prepared for slaughter; it is this type of lamb that dominates in the sales structure during the year compared to the heavy periods of consumption. Gender also has its influence on the state of fattening since males produce carcasses heavier but less fatty than females (Girard et al, 1985; Dimsoski et al, 1994; Jeremiah, 1998).

Examination of the lumbar regions of animals

By direct measurement: It simply consists of measuring with a caliper the thickness of the covering tissues at determined points:-at the level of the last lumbar vertebra, 4 cm to the right of the spine (El Fadili et al., 1997) at the height of the 13th vertebra, 4 cm from the spine (Diaz et al, 1981). -4 cm behind the last rib at 4 cm from the middle of the carcass (Miguel, 2003), this technique is simple to implement but remains very manual.

Importance of Presences of the adipose mass on the lumbar regions

Depending on the anatomical location, it is customary to distinguish 4 different types of fat: (Girard et al, 1986):

- Internal fat is deposited first in the abdominal cavity and lines the thoracic and abdominal cavities.
- Intermuscular or marbled fat: is deposited between the large bundles of muscles.
- Subcutaneous or covering fat: constitutes the covering deposits.
- Intramuscular or marbling fat: develops in the muscle bundles giving the meat a taste.

These fatty deposits are generally important to consider because of their economic impact on production, inter and intra muscular deposits are also important by their quantity and nature, because they influence the organoleptic and nutritional qualities of the meat.

In the lumbar regions, this mass of meat and fat (marbled and marbled) bears on the bones known as the Spinous Apophysis and Transverse determines in fact their structure (Fig. 1).


Fig. 1. Thicknesses of the tissues between the Transverse Apophysis well appears) Transverse and the Apophysis are well rounded.

Several studies have shown in sheep as in cattle 3 periods of relative increase in fat content with a first period of rapid increase followed by a second period of more moderate increase and finally a period of rapid increase (Robelin et al., 1979 cited by Girard et al., 1985).

Direct measurement of the thickness of the meat mass: Animals of the same species do not always have the same development capacity and depending on their genotype, their growth potential and their capacity for fattening are different. Consequently, the great effect on the proportion of muscles and their characteristics of the carcass (Hanrahan, 1999). The Fig. 2 shows the presence of ground meat and branching of fat years the total volume of lumbar.

In good breeding conditions, a mass of meat under the Apophysis appears and makes it possible to cover the needs of this region Fig. 3, the handling attains these regions and makes it possible to effectively complete the technique of total evaluation of the individual Fig. 4.
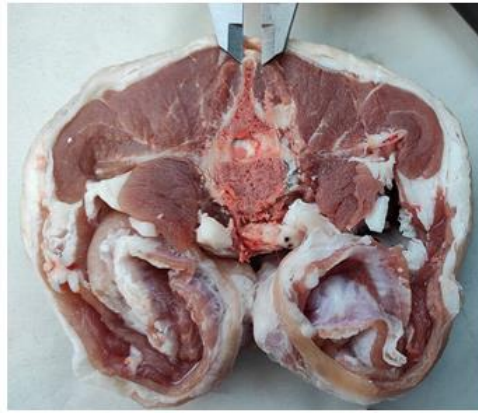
Fig. 2. Left lumbar rib Fabrics intra extra muscle well developed (mass of meat under the Apophysis).
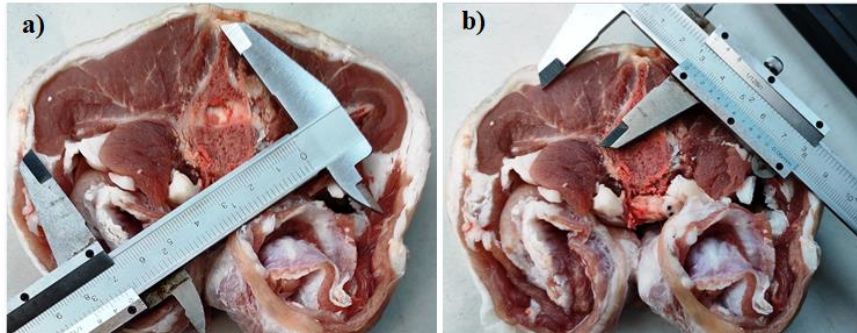
Fig. 3. (a) and (b): Coverage measurement (presence of meat mass and branching of the lumbar adipose tissue).

Fig. 4. Methods of evaluation of state body by handling. (a): E rapid weight stimulation by lifting, (b): Maniement (estimate of the left foot of the lamb presence of adipose coverage around the liver).

Statistical analyzes

The use of PCA which, generally serves to reduce information through discrimination as well as a graphical representation of correlations, this method allows us to analyze the correlations between the different variables and identify the races that are distinguished from others According to Dagnelie (1970). For a PCA the connection, in the statistical sense, between two variables will be all the stronger the closer their vector directions are, the smaller the angle formed by the two vectors. The results come from ANOVA calculations based on STATISTICA and StatBox software version 6.4.

Data collection and studied factors

Fig. 5 illustrates the variations of the qualities of evaluation of the body condition of the animals according to the different variables. The results are confirmed by the analysis of variance They show that there is a very strongly significant effect ($p<0.05$) (Table 1) on the rearrangement modes of animals according to age and weight. Both parameters relating ement to Spinous Apophysis from 0-5 and Transverse Apophysis from 0-5 represent and certify the basis of evaluation of general body condition of livestock by farmers.

The correlation circles (Fig. 6) correspond to the projection of the initial variables on a two-dimensional plane made up of the first two factors. The projection of the points on the circle is relatively close to the center of the circle. This shows that the results are in accordance with the qualitative values close to the two axes and with a significant representation of 59% on both dimensions.
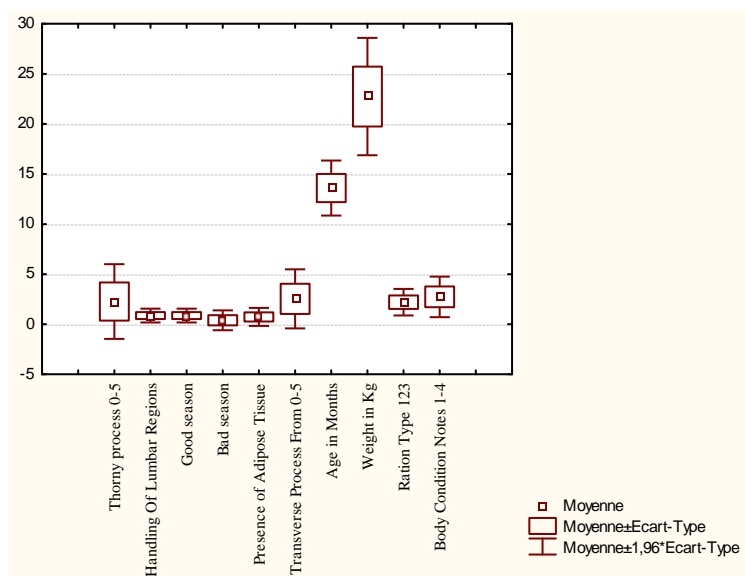
Fig. 5. Qualities Variation in the evaluation of body condition of animals by the method of evaluation of the general body condition of flocks.
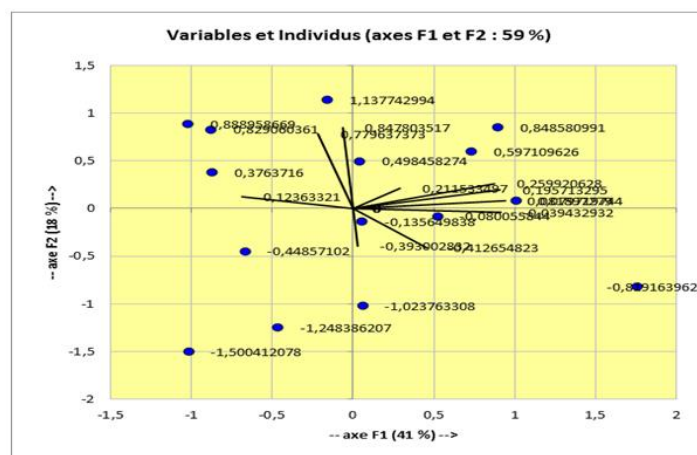
Fig. 6. Breakdowns of the groups of respondents (coordinates of all individuals).

Table 1. Comparison of means to a standard (constant).

Parameters	Average	Ec-Type	NOT	Error-T	T value	p
Spinous Apophysis 0-5	2.26667	1,907379	15	0.492483	4.60253	0.000410
Handling Of Lumbar Regions	0.86667	0.351866	15	0.090851	9.53939	0.000000
Good season	0.86667	0.351866	15	0.090851	9.53939	0.000000
Bad season	0.40000	0.507093	15	0.130931	3.05505	0.008564
Presence of Adipose Tissue	0.73333	0.457738	15	0.118187	6.20484	0.000023
Transverse Apophysis From 0-5	2.53333	1.505545	15	0.388730	6.51695	0.000014
Age in Months	13.60000	1.404076	15	0.362531	37.51406	0.000000
Weight in Kg	22.73333	2.987275	15	0.771311	29.47363	0.000000
Ration Type 123	2,20000	0.676123	15	0.174574	12.60208	0.000000
Body Condition Notes 1-4	2.73333	1,032796	15	0.266667	10.25000	0.000000

Table 2. ANOVA by Friedman & Coef. from Concord. of Kendall (Sheet.sta) ANOVA of Chi² (N = 15, dl = 9) = 106.5052 p <.00000 Coeff. of Concordance =, 78893 Avg. r =, 77385.

Parameters	Rank	Sum	Average	Ec-type
Spinous Apophysis 0-5	5.2	78	2.26667	19,07,379
Handling Of Lumbar Regions	3.43333	51.5	0.86667	0.351866
Good season	3.33333	50	0.86667	0.351866
Bad season	2.23333	33.5	0.4	0.507093
Presence of Adipose Tissue	2.96667	44.5	0.73333	0.457738
Transverse Apophysis From 0-5	6	90	2.53333	1.505545
Age in Months	9	135	13.6	1.404076
Weight in Kg	10	150	22.73333	2.987275
Ration Type 123 *	6.23333	93.5	2,20,000	0.676123
Body Condition Notes 1-4	6.6	99	2.73333	10,32,796
*The ration is composed of barley, corn and bran.				

ANOVA Table 2 clearly explains the homogeneity of the averages obtained for the presence of fat levels as according to the season. If the season and good balanced diet is in the form of fat deposition in the lumbar regions, the results of years that sense this e with average homogeneous between 2.2 and 2.7 in the four qualitative parameter is (Spinous Apophysis 0-5, Transverse Apophysis From 0-5, Ration Type 123 Body Condition Notes 1-4). On the contrary if the season is bad fat are almost missing volume meat narrow, therefore the Spinous Apophysis are sharp and appear and Transversal Apophysis are rounded and uncovered meat, it reflected and deflected the fact of handling the critical state of stocks.

Discussion

These lumbar regions present morphology and vas type measuring a very large sample, they were characterized according to the diet of animals and the duration grazing in the steppe areas in a definite time

The quantity and nature of the cattle feed distributed to the animals is liable to vary to a large extent. The quantitative and qualitative aspects of fat synthesis; indeed, even short-term changes strongly modulate the metabolic activity (lipogenesis) of adipose tissue in ruminants (Faulconnier et al., 1999).

Our breeders say the food ration composed of barley; sound (Commonly known as Daka), maize and flour, adding the taste by complementary aromatic plants in pasture such as Artemisia herba-alba (chih), and Hammada scoparia (Remth..) are more favored. These plants give their secret flavors to the quality of meat in this region. The lambs graze without restrictions in the first 6 months of their age before weaning, i.e., 0.5 kg of the daily ration and reaching 0.2 kg at the age of 14 months.

Our results demonstrated the importance of weight as a classification criterion for heavy type carcasses averaging 22.7 Kg Table 1 related to back fat thickness and carcass length and thorax and pelvic widths, justifying the good conformation of the individual.

Conformation is the quality and distribution of muscles in the carcass, describes the carcass in terms of shape and profile, and indicates the distribution of all muscle and fat according to the skeleton (West, 1995; Fisher and Heal, 2001).

A good conformation has some interesting technological consequences in terms of the thickness of the muscular planes; well-shaped lambs have a thick chop head and a more advantageous muscle-to-bone ratio than elongated animals with flattened shapes (Boccard, 1979).

Of all these factors, slaughter weight is the one that has been discussed the most in the literature; a good number of authors assert that the proportion of fat in the carcass is related to growth and increase in weight (Chestnutt, 1994; Pollot, 1994; Levalley, 1995) and that the thickness of the fat covering increases proportionally with the size and weight of the carcass (Sanz et al, 1995; Bayandir, 1980 cited by Macit, 2001; Goulet, 2002).

Season effect

The herds of steppe areas are fed according to the season:-from February to March: the animals are put on rented land to graze the young shoots of barley or oats in addition to the shrubs-from April to June and on stubble on autumn grass regrowth.

During the cold period, when the development of the vegetation is very limited, the animals receive supplements of barley and bran and corn.

Weak animals, rams as well as newly-lambed ewes and weaned lambs are kept in the sheepfold and fed with fodder supplemented with barley (Ghimouz, 1978).

The seasonal effect is very dreadful during the winter while recording a significant increase in the prices of agricultural by-products.

Conclusion

A well balanced diet plays an important role in the distribution of the fatty filaments intra and extra muscular in the pieces indicating the state of body of the whole of the animals.

Breeders say that the grazing of aromatic plants in the steppe region example the Artemisia herba-alba (C HIH) give the organoleptic characteristics. The greasy filaments give the taste to the meat of the regions very significant lower back. In parallel the effect of the intensity loam stored all throughout the day are accumulated in those governed lambaires. This is why these regions are economically important, also as a crucial indicator, the assessment of the overall body state of the herd.

At the end of this study, the lumbar regions studied in the Rumbi breed show very specific morphological aspects and an aptitude to accumulate more fat with age. So, the evaluation of the animal product involving the choice of the breed, age and food ration.

Slaughter weight and type of supply response to particular market The marketing of quality carcasses requires a better extension of you chnical less expensive and disseminated pre breeders and traders in order to help develop the sheep breeding sector this region and in the territory of Algeria.

Authors Contribution

Conflict of Interest

The authors declare no conflict of interest.

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