Quality and chemical composition of *longissimus dorsi* muscle of Béni-Guil sheep breeding in eastern Morocco

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Introduction: The sheep "Beni Guil" is one of the main breed ovine that dominates livestock farming in arid area of eastern Morocco. Beni Guil's sheep meat is an important protein source for population in this geographical zone and it is very appreciated by consumers. This reputation is still based on informal hedonic tests and currently there is no data about nutritional value and chemical composition of this meat. Thus, this research was conducted for analyzing fatty acid profile (FA) and the identification of essential amino acid content (EAA) of *Longissimus dorsi* muscle of Beni Guil breed, feed on dry land forages in eastern Morocco.

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Materiel and methods

Study zone

Animal Materiel

-10 *longissumus dorsi* muscle samples were selected and cut with the help of the agents of the National Association of Sheep and Goats

Samples Preparation

-Slaughtering and Sampling
- Cutting and Trimming of meat
- Freezing, Lyophilization and Grinding

Methods of analysis

-Dry matter : Oven Drying at 105°C.
-Fat : Bligh & Dyer (1959).
- Fatty acids (FA) : GC-FID.
- Proteins : Kjeldahl method.
-Amino Acids (AA) : HPLC.

Results

Table 1. Physical and chemical characteristics of *Longissimus dorsi* muscle of Beni Guil breed

Parametres	Means
Total dry matter (%)	25.72 ±1.10
Total Proteins (%)	19.43±1.01
Total Fat (%)	5.14±0.65
pH	5.79±0.14
Water holding capacity (%)	22.73±2.31
Cooking loss (%)	35.87±1.53

Table 2. Sums and ratios of the fatty acid contents of *Longissimus dorsi* muscle of Beni Guil breed

Sums and ratios	Content (%)
Total ω – 3	2.58
Total ω - 6	9.62
Σ SFAs	49.45
Σ MUFAs	38.48
Σ PUFAs	12.40
Σ TUFAs	50.88
PUFAs / SFAs	0.25
TUFAs / SFAs	1.04
DFA	67.90
OFA	3.52
Ratio ω6/ω3	**3.78**

SFAs, saturated fatty acids; MUFAs, monounsaturated fatty acids; PUFAs, poly unsaturated fatty acids; TUFAs; total unsaturated fatty acids; OFA, odd fatty acids; DFA, desirable fatty acids=C18:0+TUFA.

Table 3. EAA and nutritional quality of *Longissimus dorsi* muscle of Beni Guil breed **(True digestibility CUD =94%)**

AAE	% AAE Prot. LDM	% AAE Prot. Ref.
Cys-Met	2.31	1.7
His	2.47	1.6
Ile	3.15	1.3
Leu	5.11	1.9
lys	4.60	1.6
Phe	3.17	1.9
Thr	2.64	0.9
Val	3.07	1.3
Chemical Index	**132**	

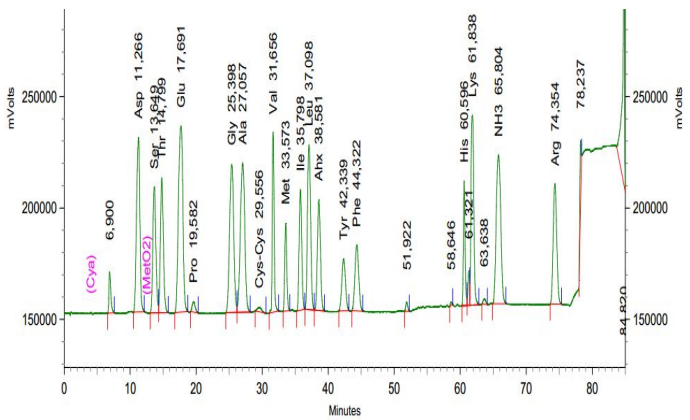

Fig. 1: Beni Guil LDM's Meat Amino acids composition

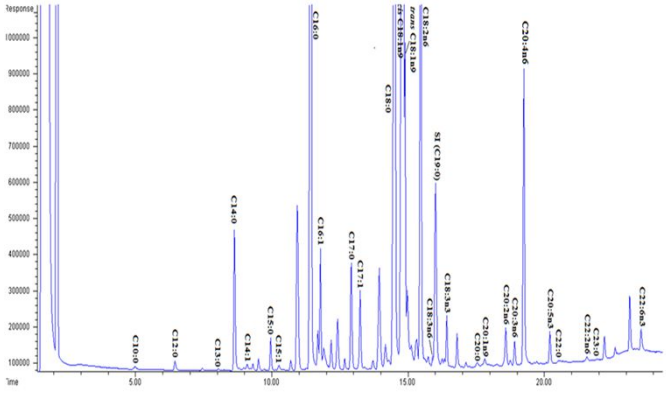

Fig.2: Meat's fatty acids profile of **Beni Guil** breed (GC-FID)

Conclusion: The results showed that 100g of fresh meat contains 25.72% of dry matter, 5.14% of Fat, 19.43% of protein and 0.94% of mineral matter. Fatty acid analysis carried out by GC-FID showed a FA profile with 49.45% SFA, 50.88% UFA. From a nutritional point of view, the meat of the Béni Guil breed has a high biological value with a **Chemical Index** of **132** and a **protein digestibility-corrected amino acid score** of **124**. Consequently, the consumption of this meat will satisfy the human nutritional needs in essential amino acids (Fig 1 & Table-3). The meat's fatty acid profile (Fig.2 & Table-2) shows a relatively high level of PUFAs compared to results reported by Santerercole, (2007) and Yousefi, (2012). Thus our results show a higher **PUFAs / SFAs** ratio compared to the value reported by Diaz in 2003. The observed **ω6/ω3** ratio of **3.78** seems to be ideal according to the agency of food safety "AFSSA-France"(2010), which estimates that this ratio must be **< 5**. But according to Lorgeril & *al* (1999), the ideal ratio is: 2:1 ≤ **ω6/ω3** < 5:1. In addition, lowest **ω6/ω3** ratios reduce the occurence of some health disorders such as cardiovascular diseases, obesity and certain cancers Simopoulos (2002). To sum up, this preliminary characterization of the meat's nutritional quality of Béni-guil's breed shows high nutritional values from a protein and lipid profile point of view . Thus this study brings nutritional information that could be considered as an add value that will contribute to the valorization and the marketing of Béni Guil sheep meat.

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