Health implication of Biellese lamb meat consumption

A. Brugiapaglia[1*], C. Lussiana[1], J. Lorenzo[2], M. Baratta[3]

[1]University of Torino, Department of Agricultural, Forest and Food Science, Italy

[2]Centro Tecnolòxico da carne, Ourense, Spain

[3]University of Torino, Department of Veterinary Science, Italy

*Corresponding author email: alberto.brugiapaglia@unito.it

I. INTRODUCTION

Consumer interest in meat fat and cholesterol content and fatty acid composition has grown in recent years due to their implications for human health. Red meat consumption is considered a dietary risk factor for cardiovascular diseases. Most of the risk of red meat intake has been related to saturated fatty acids (SFA) and cholesterol content. However, red meat is also a good source of monounsaturated (MUFA) and polyunsaturated (PUFA) fatty acids that have positive effects on human health. The Biellese sheep is an autochthonous Piemontese breed specialized for meat production due to its purported high quality. However, there is only limited information regarding Biellese meat quality. Therefore, the aim of this study was to examine the lipid fraction of meat in relation to the recent dietary recommendation for healthy intake.

II. METHODS

Nine males lambs reared in the same environmental conditions at the experimental farm of the Department of Veterinary Science of the University of Torino. The lambs were initially fed on their mother's milk and then on a good quality hay until the animals were weaned. From the 30th day they were allowed a commercial concentrate which was gradually increased to 1 kg/head/day while hay was given *ad libitum.* The lambs were slaughtered at 5 months of age and a live weight of 37 kg. After 7 days of ageing at 4°C, a portion of *Longissimus dorsi* was taken and used to determine the intramuscular fat content, the fatty acid (FA) composition and the cholesterol content. The FA composition was expressed both as percentage of total FAs and as mg/100 g of edible portion, calculated using the total fat conversion factor reported by Greenfield and Southgate (1992). The fat energy value (kcal) was calculated by multiplying the amount of fat by the conversion factors 9. Finally, the PUFA/SFA and n-6/n-3 ratios and the atherogenic (AI) and thrombogenic (TI) indices (Ulbricht and Southgate, 1991) were calculated. Values were expressed as arithmetic mean.

III. RESULTS AND DISCUSSION

The fat content of meat was lower than that reported in the CRA-NUT dataset (http://nut.entecra.it/646/tabelle_di_composizione_degli_alimenti.html?idalimento=104040&quant=100) for lamb (1.8 *vs* 2.7%). According to EFSA (2017), the intake of fats should range between 20 to 35% of total daily energy intake. Therefore, for a 2200 kcal/day diet, the recommended daily fat intake is from 49 to 86 grams. One serving (100 g) of Biellese meat provides about 3% and 1% of fat and energy, respectively. With regards to cholesterol, the meat supply a modest content (75 mg/100g) which represents about 25% of the recommended daily cholesterol intake in adults (300 mg/d). This value was similar to CRA-NUT value for lamb (74.82 mg/100g). For the prevention of cardiovascular diseases, an adequate intake of 4% and 0.5% of the total dietary energy intake should be derived from linoleic (LA) and α-linolenic acids (ALA), respectively (EFSA, 2017). This correspond to a daily intake of approximately 10 g/day of LA and 1 g/day of ALA. One serving of Biellese meat provides only 0.090 g of LA and 0.025 g of ALA. In addition, EFSA (2017) recommends a minimum of 250 mg/day of eicosapentaenoic (EPA) + docosahexaenoic acid (DHA). In this trial, EPA + DHA concentration was about 20 mg/100 g of edible meat, therefore cannot be considered as a source of EPA and DHA. In general, PUFA/SFA ratio above 0.45 and n6/n-3 below 4.0 are required in the diet to combat "lifestyle diseases". In the present study, the PUFA/SFA ratio

(0.23) was considerably lower than the recommended values, whereas the n6/n3 ratio (2.20) was within the recommended value. Atherogenic and thrombogenic indices, which indicate the global dietetic quality of the lipids and their potential impact on the development of coronary heart disease, averaged 1.0 and 1.5, respectively. According to Ulbricht and Southgate (1991), these values were within the recommended values for lambs (<1.0 and <1.58 for AI and TI, respectively).

IV. CONCLUSION

Considering the obtained results, if Biellese lamb meat is consumed according to nutritional guidelines may play a positive role for human health.

ACKNOLEDGEMENTS
Authors acknowledge funding provided by ERA-Net for EcoLamb project.

REFERENCES

Greenfield, H., & Southgate, D. A. T. (1992). Food composition data – Production, management and use. London and New York: Elsevier Applied Science.
Ulbricht, T.L.V., & Southgate, D. A. T. (1991). Coronary heart disease: seven dietary factors. The Lancet, 338(8773):985-92.
EFSA (2017). Dietary reference values for nutrients: summary report. EFSA supporting publication 2017:e15121.