PE1.43 Effect of betaine intake on muscle and backfat characteristics of pigs 278.00

Jose Neves (1) jneves@uevora.pt, Jose Martins(1), Amadeu Freitas(1) ,
(1)Evora University

***Abstract*— This study was undertaken to investigate the effects of long term betaine intake on the chemical and physical characteristics of *m. Longissimus dorsi* (LD), and backfat (BKF) of Alentejano (AL) pigs. Purebred AL pigs were allocated to open-air individual pens and fed a commercial (C) diet offered at 85% estimated *ad libitum* consumption. The pigs were divided into two experimental groups: Group C (n=6), consuming the C diet, and Group CB (n=8), consuming the C diet supplemented with betaine (1g/kg). After 20 weeks of trial, pigs were slaughtered at ~100 kg live weight (LW). LD and BKF individual samples were obtained from the chilled left half carcasses. Chemical (moisture, protein, lipids, myoglobin, and collagen) and physical (pH, water-holding capacity, CIE L*, a* and b*, chroma, and hue angle), as well as the LD area and BKF thickness, were determined. Significant differences were found mainly on the gross chemical composition and colour of LD and BKF samples. Betaine-fed pigs showed a higher (P=0.05) amount of LD neutral lipids and a lower (P<0.05) LD moisture content. Meanwhile, BKF average thickness and its lipid concentration were not affected. The fatty acid (FA) composition of lipids from LD and BKF was also not affected by treatments. On the other hand, the colour component Cie b* (yellowness) tended to be higher on LD (P=0.06) and was higher (P<0.05) on the BKF of pigs fed betaine, suggesting a global trend to a more yellowish tone in pork colour. The results obtained suggest that betaine supplementation in AL pigs has no effects on improving the lean:fat ratio of the carcass and on the LD and BKF FA profiles. However, intramuscular fat from LD was increased by betaine, as well as the yellowness on both tissues, suggesting an effect of betaine on overall pork quality.**

Neves, J., Universidade de Évora, Departamento de Zootecnia/ICAAM, Apt. 94, 7002-554 Évora, Portugal (phone: +351266760884; fax: +351266760841; e-mail: jneves@uevora.pt).

Martins, J.M., Universidade de Évora, Departamento de Zootecnia/ICAAM, Apt. 94, 7002-554 Évora, Portugal (e-mail: jmartins@uevora.pt).

Freitas, A., Universidade de Évora, Departamento de Zootecnia/ICAAM, Apt. 94, 7002-554 Évora, Portugal (e-mail: jmartins@uevora.pt).

***Index Terms*—Alentejano pig, betaine, *Longissimus dorsi*, backfat, chemical and physical characteristics**

I. INTRODUCTION

Betaine, i.e., trimethylglycine, is used in dietary supplements in human and animal nutrition. In pigs, betaine has been increasingly used as a dietary supplement to reduce fat deposition [1] but its efficacy is inconsistent. Some studies report a reduction of the body fat [1-2], while others report an increase [3] or no effect [4-5]. The Alentejano (AL) pig, an autochthonous breed reared in the southern region of Portugal, is characterised by slow growth rates and high lipogenic activity at early stages of development [6]. Nowadays, a production system based on the production of fresh meat for human consumption during all the year is been increasingly used. This system, based on free-range management where pigs are fed on natural feeds with no growth promoters and antibiotics [7], is therefore an important field of interest. However, the precocious lipogenic activity of the AL breed results in low lean:fat carcass ratio and low commercial lean cuts yield, compromising the economic viability of this alternative production system. Therefore, betaine could be used to reduce fat deposition, with a beneficial impact on the commercial value of the AL carcass. However, very little research has been conducted evaluating the effects of betaine on pork quality. Producers using betaine as a carcass modifier have limited or no information regarding possible alterations of the chemical and physical characteristics of muscles and fat obtained from pigs (namely form AL pigs) long-term supplemented with this compound.

The purpose of this study was to evaluate the effects of long-term betaine supplementation on the chemical and physical characteristics of *m. Longissimus dorsi* (LD) (representative of the loin meat cut), and of the backfat (BKF) from AL pigs slaughtered at ~100 kg LW.

II. MATERIALS AND METHODS

Fourteen AL pigs were allocated in open-air individual pens (3m^2), fed a commercial diet (C) offered at 85% estimated *ad libitum* consumption, and divided into two experimental groups: i) Group C (n=6), consuming the C diet; and ii) Group CB (n=8), consuming the C diet supplemented with betaine (1g/kg) (Betafin® S1, Danisco Animal Nutrition). At an average LW of 100 kg, pigs were