

Influence of dietary betaine supplementation on chemical composition, meat quality and oxidative status of pork



Ivan Bahelka, Dana Peškovičová and Peter Polák
 Animal Production Research Centre, Lužianky, 951 41 Slovak Republic
 E-mail: bahelka@cvzv.sk



Introduction

A number of studies has evaluated the effect of betaine supplementation on growth and carcass value in pigs (Cadogan et al., 1993; Virtanen & Campbell, 1994; Casarin et al., 1997; Cromwell et al., 1999; Lawrence et al., 2002; Fernández-Figares et al., 2008). Currently, the pig industry is focused on improving pork quality. Very little research has been connected with possible influence of betaine on pork quality. Moreover, some authors reported positive effect on pork quality (Matthews et al., 1998, 2001), but others did not (Overland et al., 1999).

Aim

An experiment was conducted to determine the effect of dietary betaine on chemical composition, pork quality and oxidative status of longissimus dorsi muscle.

Material & methods

- Sixty hybrid pigs Lx(HAxPN), control group (n=30) fed diet without betaine, experimental fed 1.25 g/kg betaine for 30 days prior to slaughter
- Samples of longissimus dorsi muscle (L.D.) were taken 24 h post mortem and chemical composition and meat quality traits were analysed
- One wrapped sample was stored at 4 °C for 5 days for shear force and colour analyses
- Twenty minutes after slaughter, the samples of L.D. were taken and immediately frozen in liquid nitrogen, the stability of skeletal muscle lipids against stimulated lipid oxidation (with Fe²⁺/ascorbate at different incubation time) was evaluated by TBARS values

Table 1. Chemical composition of pork

	Control	Betaine	Sign.
Total water, %	73.85	73.60	n.s.
Total protein, %	22.53	22.48	n.s.
Intramuscular fat, %	2.65	2.69	n.s.

Table 2. Oxidation stability of pork

	Time	Control	Betaine	Sign.
TBARS, nM/mg	0	0.62	0.58	n.s.
TBARS, nM/mg	30	2.00	2.28	n.s.

Table 3. Pork quality

	Control	Betaine	Sign.
pH ₄₅	6.28	6.31	n.s.
pH ₂₄	5.54	5.60	n.s.
Drip loss ₂₄	4.34	4.05	n.s.
Colour ₂₄ – L*	49.31	49.97	n.s.
a*	1.81	1.88	n.s.
b*	7.74	7.77	n.s.
Colour _{5days} – L*	51.48	51.12	n.s.
a*	2.55	2.44	n.s.
b*	8.29	8.62	n.s.
Shear force _{5days}	5.55	5.04	n.s.

Conclusion

Supplementation of diet with 1.25 g/kg betaine did not have any significant effect on chemical composition, meat quality of fresh and 5-days stored pork or antioxidative stability of muscle.

The tendency of decreasing drip loss and improved shear force was just suggested. Further research is needed concerning level or time of betaine supplementation.

References

Cadogan et al. (1993) F.S. Batterham (ed.), *Manipulating Pig Production* 2V, p. 219, Werrabee, Australia; Casarin et al. (1997) *J. Anim. Sci.*, 75 (Suppl. 1); Cromwell et al. (1999) *J. Anim. Sci.*, 77 (Suppl. 1): 79 (Abstr.); Fernández-Figares et al. (2008) *J. Anim. Sci.*, 86: 102-111; Lawrence et al. (2002) *J. Anim. Sci.*, 80: 475-482; Matthews et al. (2001) *J. Anim. Sci.*, 79: 967-974; Matthews et al. (1998) *J. Anim. Sci.*, 76: 2444-2455; Overland et al. (1999) *J. Anim. Sci.*, 77: 2143-2153; Virtanen & Campbell (1994) *Handbuch der Tierische Zucht*, 19: 145-150. Verlag H. Kamlage, Osnabrueck, Deutschland