THE EFFECT OF DIETARY TRYPTOPHAN ON PIG BEHAVIOUR AND MEAT QUALITY - PRELIMINARY RESULTS

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The quality defect 'pale, soft, exudative' (PSE) pork is caused by an acute stress response of the pig pre-slaughter and is estimated to cost the Australian pig industry in excess of $20 million per year. Dietary tryptophan has been reported to reduce the stress response of horses to trucking and to alleviate laying hysteria in hens. This preliminary experiment investigated the influence of excess dietary tryptophan on pig behaviour during lairage at the abattoir and subsequent meat quality of the carcass.

Fifty entire male Large White x Landrace pigs weighing 85 to 90 kg were randomly allocated to a dietary treatment: (i) tryptophan, five g of tryptophan/kg of feed for five days pre-slaughter, and (ii) control, zero tryptophan added. Pigs were last fed at 0730 hours, were transported to the abattoir at 1300 and allocated to two pens at the abattoir where the number of aggressive acts (one pig bites/slashes at another) and number of mounts (one pig mounts another) were recorded in five minute time blocks using video cameras. After 17 hours in lairage, pigs were slaughtered and chilled and the initial pH (pHi) and ultimate pH (pHu) and colour in the loin (*M. longissimus thoracis)* and ham (*M. quadriceps femoris)* were measured. Data were analysed by analysis of variance using the pig at each time period as the experimental unit for the behaviour data and the carcass as the experimental unit for the meat quality data. The chi-squared test was used to compare the incidence of PSE and DFD between treatments.

The tryptophan-treated pigs had a lower number of aggressive acts (2.4 vs 4.6 per five minute period, s.e.d. = 0.531; $P<0.001$) and a lower number of mounts (3.2 vs 4.9 per five minute period, s.e.d. = 0.70; $P<0.05$) averaged over the three hours in lairage. Figure 1 presents the cumulative number of mounts and aggressive acts/pig over the three hour recorded lairage period. There were no differences ($P>0.05$) between treatments in pHi, pHu or colour of the LT or QF muscles. Tryptophan-treated pigs produced 24% PSE (pHi<6.0) and 4% DFD (pHu>6.0) carcasses compared with 35% PSE and zero DFD carcasses in the control group ($P>0.05$ for all). Preliminary conclusions are that dietary tryptophan reduced aggressive behaviour and mounting of pigs in lairage. Although not evident in this experiment, dietary tryptophan may be beneficial in reducing the occurrence of PSE in pork carcasses under conditions where pigs are stressed pre-slaughter because of genetic propensity to stress or adverse environmental conditions, and warrants further investigation.

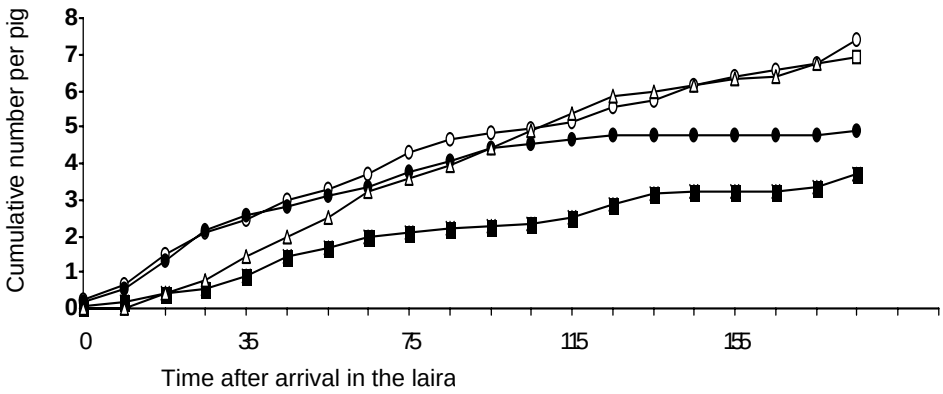

Figure 1. Cumulative number of aggressive acts (●Tryptophan, ❍ Control) and mounts per pig (■ Tryptophan, □ Control) observed during the 3 hrs in lairage subsequent to arrival at the abattoir Each point represents a cumulative average/pig during each five minute time period