

EFFECT OF DIETARY SUPPLEMENTATION OF *LASIA SPINOSA* THW. POWDERS ON CARCASS AND MEAT QUALITY OF FINISHING BARROWS

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Abstract – The aim of the present study was to study the effect of dietary supplementation of *Lasia spinosa* Thw. powders on carcass and meat quality of finishing barrows. Total 14 finishing pigs were randomly selected for the present study, with an average body weight of 64.86 kg. The pigs were allocated into 2 groups equally. The pigs were housed individually and offered *ad libitum* diet. The pigs in the control group were offered a basal diet without supplementation of *Lasia spinosa* Thw. powders while the pigs in the treatment group were offered a basal diet with supplementation of *Lasia spinosa* Thw. powders at 1% level. The study was lasting for 45 days and all studied pigs were slaughtered and measured for carcass and meat quality. The results have shown that no influence of dietary supplementation on carcass weight, carcass length, backfat thickness and LSQ index. For meat quality, there was a trend of higher tenderness of pork from the treatment group while no difference for %drip losses, odor score, muscle fiber size & density and sarcomere length. Hence, the dietary supplementation of *Lasia spinosa* Thw. powders at concentration of 1% for finishing barrows had no any adverse effect on their carcass and pork quality.

Key Words – Barrows, Carcass quality, Dietary supplementation, *Lasia spinosa* Thw., Meat quality

I. INTRODUCTION

It has been proved that intact male pigs have better performance than barrows in term of higher proportion of lean tissue, growing faster and giving a higher net financial benefit from rearing [1]. However, boar taint, an unpleasant odor, emanates from boar fat when it is heated, which is a potential problem with rearing boars for pork [2]. Therefore, piglets reared for selling pork were normally castrated to reduce the problems concerning unpleasant odor, resulting in easier to getting fat. An alternative to solve this problem is giving an exogenous testosterone to keep barrows with lesser fat deposit in body and good quality of pork. *Lasia spinosa* Thw. was a locally plant of

Thailand, containing testosterone hormone especially in rhizome and stem [3]. It has been reported that the use of dry rhizome and stem powders of *Lasia spinosa* Thw. could improve reproductive performance of boars [4]. It is possible to use *Lasia spinosa* Thw. supplemented in diet to increase testosterone level and improve pork quality of barrows. Thus, the current study was aimed to investigate the effect of dietary supplementation of *Lasia spinosa* Thw. powders on carcass and meat quality of finishing barrows.

II. MATERIALS AND METHODS

Total 14 finishing pigs were randomly selected for the present study, with an average body weight of 64.86 kg. The pigs were allocated into 2 groups equally; Control and Treatment. The pigs were housed individually and offered *ad libitum* diet and water in a pig farm located in Nakhon Pathom province. The pigs in the control group were offered a basal diet without supplementation of *Lasia spinosa* Thw. powders while the pigs in the treatment group were offered a basal diet with supplementation of *Lasia spinosa* Thw. powders obtained from rhizome and stem parts at 1% level. The stem and rhizome parts contained testosterone 0.19 and 0.92 ng/g dry weight, respectively. The study was lasting for 45 days. At the end of this study, all studied pigs were slaughtered and measured for carcass (carcass weight, carcass length, backfat thickness and LSQ index) and meat quality (% drip losses, odour score, tenderness score, muscle fiber size, muscle fiber density and sarcomere length). Briefly, hot carcass weight was measured after removing all internal organs including kidney. Fat-lean ratio was expressed according to the LSQ (Lenden-Speck-Quotient) system of Pfeiffer & Falkenberg [5]. The thickness of back fat was determined according to standard methods described previously [6]. Proportion of drip losses was assessed as the proportionate

weight loss of a slice of *Longissimus dorsi* muscle (thickness of 2.54 cm) that had been suspended in a plastic bag for 24 h at 2°C [7]. Approximately 50 panellists with un-training were encouraged to participate in sensory assessment for determining odor and tenderness score. Pork samples were prepared and then stained for Hematoxylin and eosin (H&E). Subsequently, a light microscope with measuring function accessories was used to determine or quantified sarcomere length and size & number of muscle fiber. For statistical analysis, the independent student's *t*-test was applied for detecting statistical difference at $P < 0.05$.

III. RESULTS AND DISCUSSION

There was no influence ($P > 0.05$) of *Lasia spinosa* Thw. powder dietary supplementation on carcass quality (Table 1); carcass weight, carcass length, backfat thickness and LSQ index. These results indicated no effect of testosterone in *Lasia spinosa* Thw. powders on growth of barrows. It would be explained by the earlier report [8] that barrows had lower circulating growth hormone than boars and exogenous testosterone for 10 days did not stimulate endogenous or growth hormone-releasing factor, except for the amplitude of the endogenous growth hormone peaks. Although there was evidence for blood testosterone increased after receiving *Lasia spinosa* Thw. powders in boars [9].

Table 1 Mean \pm SD for carcass and meat quality of the experimental barrows

Variable	Control	Treatment	P-value
Carcass quality			
Carcass weight, kg	98.25 \pm 5.97	99.75 \pm 7.18	0.759
Carcass length, cm	92.56 \pm 3.45	93.25 \pm 1.90	0.743
Backfat thickness, cm	2.54 \pm 0.34	2.56 \pm 0.20	0.913
LSQ index*	0.25 \pm 0.07	0.25 \pm 0.06	0.848
Meat quality			
Drip losses, %	2.57 \pm 0.90	2.65 \pm 1.10	0.914
Odor score**	6.31 \pm 0.30	6.33 \pm 0.33	0.927
Tenderness score***	4.75 \pm 0.60	5.71 \pm 0.31	0.069
Muscle fiber size, $\times 10^3 \mu m^2$	2.07 \pm 0.41	1.97 \pm 0.39	0.736
Muscle fiber density, $\times 10^3 /mm^2$	0.54 \pm 0.17	0.51 \pm 0.07	0.731
Sarcomere length, μm	1.24 \pm 0.11	1.26 \pm 0.14	0.792

*LSQ = Lenden-Speck-Quotient

** Score; 0=extremely weak, 10=extremely strong

*** Score; 0=very toughness, 10=very softness

For meat quality (Table 1), there was only a trend of higher tenderness ($P = 0.069$) of pork from the treatment group compared to the control group. There were no difference ($P > 0.05$) between the control and the treatment group for %drip losses, odor score, muscle fiber size, muscle fiber density and sarcomere length (Table 1). As mentioned earlier, the pigs in the treatment group were presumably augmented for testosterone in blood circulation. From earlier study [10], more body fat leads to a higher conversion of testosterone to estradiol by aromatase in fat tissue. These might be an explanation for the studied finishing barrows, which deposited more fat. When they received testosterone from *Lasia spinosa* Thw. powders, they would have higher estradiol, resulting in meat tenderness increased as expressed by Swatland [11]. There was seemed to be beneficial results that the odor of treated pigs had no difference odor pork compared to those in the control groups. This would be the fact that testosterone is not itself responsible for boar taint whereas 5 α -androstenone is the pheromone most closely associated with boar taint and is not produced by peripheral metabolism of testosterone [12]. The dietary treatment had no influence on water holding capacity expressed by % drip losses in this study and also no effect on muscle fiber morphology and sarcomere length. These would be that the supplementation of *Lasia spinosa* Thw. powders in this study was done in finishing barrows, which in the period of more fat deposition compared to protein deposition, resulting in difficulty to make morphology and property of muscle fibers different.

IV. CONCLUSION

The dietary supplementation of *Lasia spinosa* Thw. powders at concentration of 1% for finishing barrows had no any adverse effect on their carcass and pork quality.

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