

USE OF FEED SUPPLEMENTS FOR PIG CARCASS QUALITY

The one criterion of pork quality that unites both swine producers and consumers, especially health-conscious ones, is the leanness of the pork. To cater for this, plenty of feed supplements have been developed and made readily available to provide an economic package for swine producers to improve the yield of the leaner carcasses. Thus although feed supplements are considered non-essential feed ingredients, swine producers are financially motivated to incorporate such supplements into the feed of their produce. Consequently, quality standards, such as the LSQ, have been developed to help producers objectively grade their produce, and to select the ideal feed supplement which can perform consistently. Nevertheless, while focused on improving the produce, swine farmers also have to be conscious of any residual effects of the supplement on the meat and offal destined for human consumption.

In this technical paper, we present on a swine trial conducted with PRIMOS 25, a natural feed supplement without withdrawal period, to determine its influence on the carcass quality of pig slaughtered in Thailand.

PRIMOS 25 FOR PIG CARCASS QUALITY

A trial with PRIMOS 25 was conducted on a 5,000-sow level, farrowing-to-finishing farm in Chonburi Province, Thailand. Apart from the usual performance indicators, the farm sought to challenge PRIMOS 25 on the carcass quality based on LSQ [1].

1,969 starter pigs were randomly grouped into Control Group (971 pigs) and PRIMOS 25 Group (998 pigs), and evaluated till the finisher stage, across 2 similar finishing units. Mash feed was provided *ad-libitum* throughout the 3 growth stages, formulation as per normal practice of the farm. The PRIMOS 25 group had PRIMOS 25 supplemented in the feed; starter feed with PRIMOS 25 at 0.5kg per ton of feed, and at 1.0kg per ton of feed for grower and finisher feeds.

155 carcasses were randomly sampled from both groups at slaughter and the quality graded accordingly to the LSQ (Lenden-Speck-Quotient) spectrum proposed by Sethakul *et al.* [2] (Figure 1).

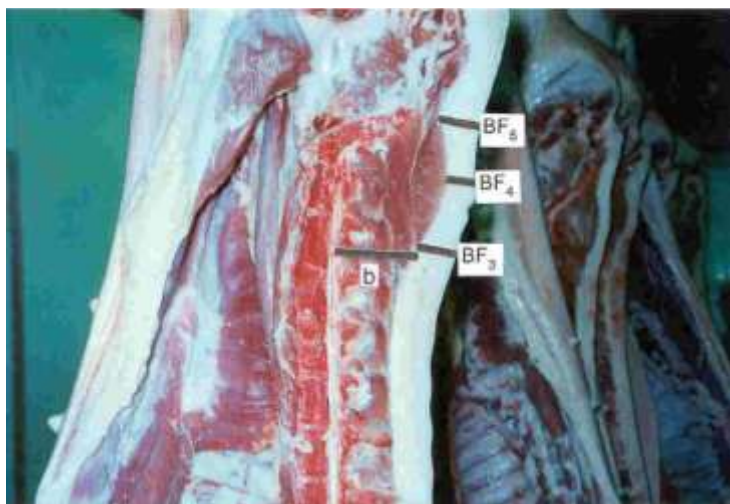


Figure 1: The LSQ determines the fat-lean meat ratio of the swine carcass, and is calculated as $(B3 + B4)/(2 \times b)$ where B3 = back fat thickness at the front base of gluteus muscle, B4 = back fat thickness on top of gluteus muscle, b = distance from the front base of gluteus muscle to the dorsal border of the spinal cord. Measurements are made using Vernier calipers.

PERFORMANCE OF PRIMOS 25

Carcass Quality

Initial measurements on distance 'b' and back-fat of the gluteus muscle indicated that, in general, carcasses from the PRIMOS 25 group had relatively more lean meat and thinner back-fat as compared to the Control group (Figure 2):

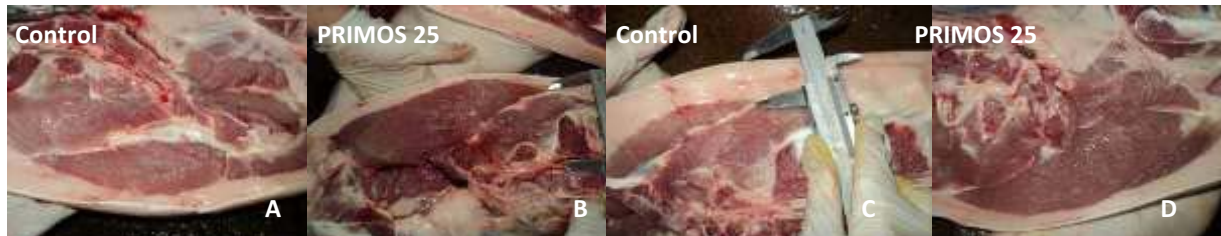


Figure 2: Measuring sections of gluteus muscle to calculate LSQ. B measures lean meat (distance b), while C measures back-fat. Note the relatively thicker back-fat and thinner muscle layer in A and C as compared to B and D.

This trend was substantiated when the carcasses were graded by the LSQ spectrum. There was a paradigm shift of the carcass quality towards the top 'A' grade with PRIMOS 25; the magnitudes of decrease declined from Grade 'C' to 'B+', and in turn, all the decreases were translated into a 105.5% increase in Grade 'A' carcasses. (Table 1):

Grade	LSQ	Control Group (n=63)	PRIMOS 25 Group (n=92)	%Δ
Excellent (A)	≤0.20	20.6%	42.4%	105.5%
Very Good (B+)	0.21-0.26	42.9%	39.1%	-8.7%
Good (B)	0.27-0.32	25.4%	13.0%	-48.7%
Fair (C)	0.33-0.38	11.1%	5.4%	-51.1%
Poor	0.39-0.44	0	0	0
Very Poor	≥0.45	0	0	0

Table 1: Comparison between PRIMOS 25 supplemented pigs (PRIMOS 25 group) and Control group, on distribution of carcass quality scores. Scoring of carcass quality is done by LSQ, and the spectrum to grade the score is proposed by Sethakul *et al* [2].

Besides, Sethakul *et al.* also reported that the LSQ was a more accurate representation of the % fat and % lean of the carcass as compared to other equivalent indicators [2]. Thus, in terms of the LSQ spectrum, as swine producers seek to produce leaner carcasses, they will aim to achieve a low fat-to-lean meat ratio of less than 0.26, *i.e.* grade 'B+' or better, to be in the premium band.

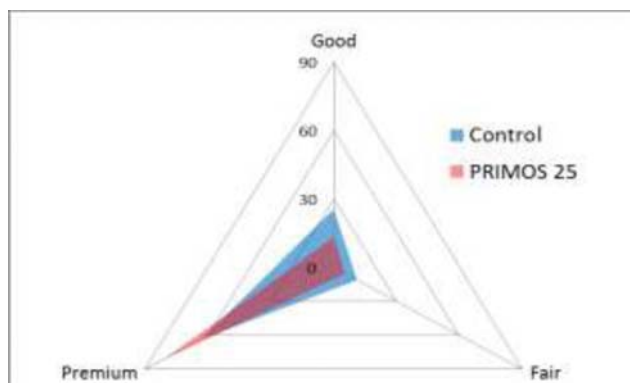


Figure 3: Shift of carcass quality distribution with PRIMOS 25. Produce is more uniform, with more attaining the premium grade. Fair (grade 'C'), Good (grade 'B'), Premium (grade 'B+', 'A').

From the results, we observe that with PRIMOS 25, while the number of carcasses that qualified for the premium grades, *i.e.* grade B+ and A, increased by 18% points to 81.5%, there is also greater uniformity in the quality of the produce (Figure 3). These results not only translate to better returns for the producers, but also enhanced productivity especially for those practicing all-in-all-out farming.

Similarly, the result of this trial corresponded well with that of a commercial farm trial conducted in the Philippines in 2008, when the total lean weight of the swine carcasses from the PRIMOS 25 supplemented group bettered the ractopamine-treated group by 15.4%. Again, the result corresponded well with that of an animal trial conducted by the Kagawa Prefecture Livestock Research Station in Japan in 2011.

ADG and FCR

Compared with pigs from the Control Group, starter to finisher pigs supplemented with PRIMOS 25 did not show any significant improvement in the average daily weight gain (ADG) and feed conversion ratio (FCR). The optimized feed formulated for efficient utilization was indicative of the excellent FCR of 2.5 in the Control Group (Table 2):

	Control Group	PRIMOS 25 Group	%Difference
No. of pig at start	971	998	
Ave. Start weight (kg)	10.8	11.3	4.63%
Ave. End weight (kg)	103.1	108.2	5.01%
Ave. Days to market	131.7	130.0	-1.65 days
ADG (g)	632.6	668.2	5.63%
FCR	2.5	2.49	-0.40%

Table 2: Comparison of PRIMOS 25 supplemented starter-finisher pigs (PRIMOS 25 group) against Control group. The efficacy of PRIMOS 25 was evaluated on key performance indicators identified by the farm.

CONCLUSION

PRIMOS 25 as a 100% natural feed supplement, is an effective alternative to other feed supplements for increasing the leanness of the carcass. With PRIMOS 25, the pigs not only had less fat, but had better conformation, and thus the carcasses are able to qualify for higher quality grading, with most achieving the premium grade.

ACKNOWLEDGEMENTS

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REFERENCES

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- [2]: Jutarat Sethakul et al. (2003). Grading of Pigs using LSQ Agriculture Science Journal, Vol. 34 : 3-6 (Supplement), pp 228-231.