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Effect of by product from coconut oil production on carcass traits of growing-finishing pigs (#209)

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Introduction

The coconut palm (*Cocos nucifera* L.) is grown in more than 80 countries in the world. This multipurpose tree is used for food, animal feed, beverage, shelter, dry to produce fertilizer or grow crops. The main coconut by product, copra meal or coconut oil meal, is produced by expeller extracting or solvent extracting the oil from dried coconut kernels [1,2]. With the increased production of livestock such as swine industry, demand for feed is also increasing. Those are needed to be an alternative feed ingredient which are sufficient production, stable supply, storage convenience and cheaper price than established ingredients [3].

The remaining oil in copra meal and copra expellers contains 50 to 70% of medium-chain, saturated fatty acids (lauric acid and myristic acid), which can result in firmer carcass fat when high levels of copra meal are used in the diet [4]. Kim et al. [5] reported that copra meal with 0.1% of β-mannanase (800 IU) could be supplemented instead of corn and soy bean meal up to 25% without detrimental effects on growth performance and pork quality of growing-finishing pigs. Since, the copra meal is useful in animal feed, this experiment was conducted to study the effect of dietary copra meal on carcass and meat quality of pork.

Methods

The experiment was conducted in crossbred (Large white x Landrace x Duroc) growing-finishing pigs. Ten pigs were randomly allocated into 5 treatments in 2 replicates. The treatment groups consisted of 0 (T1), 10 (T2), 20 (T3), 30 (T4) and 40 (T5) percent of copra meal. The data of carcass traits of pig were subjected to analysis of least square means in a completely randomized design (CRD) using the Statistical Analysis Systems Institute software package.

Results

The effect of dietary levels of copra meal on carcass traits ingrowing-finishing pigs was presented in Table 1. The results revealed that the dietary levels of copra meal effects to carcass length, fillet, total bone weight ($P<0.05$) and fresh side bacon ($P<0.01$). There was no significant difference among treatments in carcass yield, backfat thickness, loin, shoulder, ham and total of fat and skin ($P>0.05$). However, there was a trend for better carcass trait when the copra meal was supplemented at the level of 20%. The residual oil in copra meal contains high level of lauric acid and myristic acid as a result in three to five times greater in the backfat of pigs fed 30% copra meal compared with pigs fed 10% copra meal [6]. Kim et al. [3] founded that use of diets containing copra meal has no negatively influence on pork quality parameters such as fatty acid or dressing percentages and also produces firm fat in pigs.

Moreover, the analyses of data on red and white offal indicated that stomach weight was a significant higher ($P<0.05$) in T5 followed by T4, T3, T2 and T1, respectively (Table 2). No significant difference in heart, kidneys, spleen, liver, lung, large intestine, small intestine, urinary bladder and gall bladder was observed between treatment groups ($P>0.05$). Even though copra meal showed an economical and valuable by product feed for pigs and can be used to partially replace costly imported feed such as soybean meal, however, the high fiber content of copra meal restricts its use in pig feeding [4].

Conclusion

The different levels of copra meal in dietary of growing-finishing pig effect to carcass length, fillet, total bone weight, fresh side bacon and stomach weight.

References

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Notes

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Items	Percentage of copra meal					SEM	P-value
	0	10	20	30	40		
Final weight, kg	123.50	109.00	115.25	114.50	104.25	-	-
Carcass yield, %	77.20	77.96	80.04	74.22	78.87	0.38	ns
Carcass length, cm	83.50^{ab}	81.50^{b}	85.00^{a}	81.50^{b}	78.00^{c}	0.38	*
Back-fat thickness, cm							
P1	27.07	29.69	38.51	38.72	31.54	2.93	ns
P2	22.32	18.71	17.39	20.24	16.05	0.88	ns
P3	20.95	16.60	19.08	17.40	18.08	1.22	ns
Average P1-P3	23.45	21.67	24.99	25.45	21.89	1.68	ns
Fillet, kg	1.35^{b}	1.37^{ab}	1.52^{a}	1.34^{b}	1.13^{c}	0.02	*
Loin, kg	7.80	7.75	7.97	5.05	6.50	0.32	ns
Shoulder, kg	13.22	12.74	13.72	13.30	11.71	0.14	ns
Bacon, kg	10.65^{A}	8.85^{C}	9.65^{B}	9.73^{B}	9.18^{BC}	0.07	**
Ham, kg	19.10	17.50	19.40	18.30	16.30	0.28	ns
Fat + skin, kg	8.32	5.13	6.46	6.24	6.98	0.29	ns
Bone, kg	13.93^{a}	13.31^{ab}	13.92^{a}	11.25^{b}	11.97^{ab}	0.26	*

^{a,b,c,} * Means within rows with different superscripts differ ($p<0.05$).
^{A,B,C,} ** Means within rows with different superscripts differ ($p<0.01$).

Table 1 Effect of dietary levels of copra meal on carcass traits in growing-finishing pigs.

Items	Percentage of copra meal					SEM	P-value
	0	10	20	30	40		
Heart	0.42	0.35	0.40	0.37	0.33	0.02	ns
Kidneys	0.34	0.32	0.37	0.33	0.31	0.01	ns
Spleen	0.17	0.18	0.19	0.17	0.17	0.01	ns
Livers	1.93	1.89	1.88	1.83	1.69	0.05	ns
Lungs	1.29	1.14	1.29	1.28	1.19	0.02	ns
Stomach	0.77^{a}	0.72^{a}	0.70^{ab}	0.59^{bc}	0.51^{c}	0.01	*
Large intestine	2.45	1.21	1.90	1.93	1.90	0.14	ns
Small intestine	0.70	1.05	0.83	0.89	1.09	0.09	ns
Urinary bladder	0.55	0.35	0.34	0.61	0.61	0.06	ns
Gall bladder	0.96	0.14	0.17	0.16	0.16	0.17	ns

^{a,b,c,} * Means within rows with different superscripts differ ($p<0.05$).

Table 2 Effect of dietary levels of copra meal on red and white offal in growing-finishing pigs.

Notes