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5-ENGLISH SUMMARY

This study was carried out at the Poultry Experimental Station, Faculty of Agriculture, belonging to Al-Azhar University, Nasr City, Cairo, A. R. E. The main target of this study was to alleviating of heat stress in summer season resulted from feed digestion by substituting 15, 20, 25 and 30 % of energy supplied by corn in a control diet with energy from by-product of palm oil extraction (POE) to combat heat stress and enhance productive performance of Japanese quail. Also, study the effect of inclusion POE at different levels on carcass characteristics, carcass chemical composition, liver composition, abdominal fatty acid profile, some blood plasma parameters, digestibility of different nutrients, intestinal and liver histomorphometric traits as well as economic efficiency of diets used in the study under the Egyptian conditions.

All chicks of Japanese quail were brooded together for the first 7th days of age to avoid any mortality that occur during the first 7 days of age. At start of experiment a total of 375, 7-d old Japanese quail chicks were selected and randomly distributed following a completely randomized design into 5 treatment groups (No = 75 chicks/group), where each treatment having three replications (n=25 chicks/ replicate). All diets were offered nutrient requirements and formulated to be iso-caloric and iso-nitrogenous to contain almost 24 % of CP and 2900 Kcal ME /Kg

of diets according requirements published in (NRC, 1994). Diets and water was offered *ad libitum* along the experiment.

The obtained data can be summarized as follows:

1. The results indicated that POE contains approximate proportions of each saturated and unsaturated fatty acid, where the highest saturated fatty acid was observed for palmitic acid (C16:0) compared with other saturated fatty acid.). On the other hand, the highest level of unsaturated fatty acid recorded for oleic acid (C18:1) compared with other unsaturated fatty acid.
2. There was marked increase in either body weight or weight gain with each increment of POE inclusion in the diets from 15 to 30% at 28 and 42 d of age and the differences were significant compared to control group
3. Feed intake, energy and protein intake insignificantly affected due to the inclusion POE in the diets under the condition of the present study However, the addition of POE in quail diets at different levels has positive effect on FCR compared with control group. Also, protein and energy efficiency ratio insignificantly affected during the period 7-28d of age, while they were significantly improved during the later periods of experiment.
4. No health problems occurred during the trial due to addition of by-product POE dietary supplementations, where no mortalities observed along the experimental period.

5. Results indicated that inclusion of POE in quail diets no adverse effects of both hematological and biochemical parameters. Where the addition of POE decreased lipid profile including total lipids, triglycerides, cholesterol, LDL and v LDL. While, HDL significantly increased due to the increase levels of POE in the diets.

6-The findings showed that the addition of POE in diets have distinctive impacts on the development of intestine histomorphological parameters. Clearly, it is observed that supplementation of POE in the quail diet markedly improved gut health by enhancing duodenal villus height and wider crypt depth

7. Results indicating that the increasing amounts of POE in the diets significantly ($P \leq 0.05$) increased the digestibility of different nutrients including CP, EE and CF. However, the values of AME was also increased with increasing levels of POE supplementation.

8. Results also indicated that the inclusion of POE in the diets of Japanese quail may have marked influence body composition and sensory traits. Organoleptic traits significantly improved due to the increase level of POE in the diets.

9. The addition of POE in the diets significantly affected most of relative carcass traits, with exception of spleen, front weight, kidney and edible weight.

10. Liver composition and cholesterol contents also significantly affected by the inclusion of POE in the diets. The cholesterol content of liver significantly decreased due to the increased level of POE in the diet.

11. No histological lesions detected for liver tissues when supplement POE in the diets.

12. Some physiological traits including rectal body temperature, reparation rate, skin temperature, and feather temperature measured through the experiment showed significant decreases of these traits when inclusion POE in the diets.

13. The data indicated that quails fed different levels of POE recorded lower feed cost and higher economic efficiency compared with quails fed control diet

Conclusion and application:

In summary, based on the obtained results, it might be concluded that the addition of POE up to 25% significantly improved either performances or physiological status. Further, feeding Japanese quail on diets inclusion POE increased economical efficiency and alleviating the adverse effects of heat stress in summer season.