

Fat Content and Fatty Acids Profiles of Rejected Ducks Fed Nonconventional Ration With Natural Hydroxy Citrate {[α]-HCA} Addition"

By Dewi Wahyuni

Fat Content And Fatty Acids Profiles Of Rejected Ducks Fed Nonconventional Ration With Natural Hydroxy Citrate {(-)-HCA} Addition

Elis Dihansih, Dede Kardaya, Dewi Wahyuni

Abstract: The higher fat content of rejected duck will result in off odour and disturb consumer health. Feeding ration with *Garcinia atroviridis* is expected to solve the problem. The present study evaluated the effect of natural Hydroxy citrate (*Garcinia atroviridis*) on the fat content and fatty acid profiles of rejected ducks. A total of 60 rejected duck were distributed according to a completely randomized design into four treatments (R0: nonconventional ration; R1: nonconventional ration with *Garcinia atroviridis* leaf meal 2%; R2: nonconventional ration with *Garcinia atroviridis* leaf meal 4%; R3: nonconventional ration with *Garcinia atroviridis* 6%) with 5 replicates of 3 birds per replicates. Feeding ration contained 2% of *Garcinia atroviridis* leaf meal to the rejected ducks decreased ($p < 0.05$) fat content of the meat and meat with skin. However, there was no significant difference ($P > 0.05$) in saturated fatty acids and unsaturated fatty acids between treatments. The use of *Garcinia atroviridis* leaf meal to rejected ducks to reduce fat content of the meat or the meat and skin.

Index Terms: *Garcinia Atroviridis*, saturated fatty acid, unsaturated fatty acid, cholesterol, meat duck quality.

1. INTRODUCTION

The Ducks population in Indonesia in 2018 reached 51,239,000 tails. [1] The duck plays mainly as an egg producer while the ducks that have eggs production have gone down to use for their meat. However, the meat of the rejects has a high fat content, the texture of clay and its signature aroma (off flavor) sharper. Ducks as waterfowl have more subcutaneous fat. The fat content of duck meat is twice as high as chicken meat, especially unsaturated fatty acids that result in off-flavour in duck meat. This resulted in consumer demand for duck meat still much lower compared to broiler meat. In addition, consumer preference to food-oriented health (health food) to avoid degenerative diseases caused by consuming excess fats. Increased quality of duck meat can be sought by feeding additives containing high antioxidant and active substances that can reduce the level of meat fat. This of course will require additional feed charges for basal rations during the program. Then to reduce the cost of feed used nonconventional rations. Imported feed material is closed with agricultural waste and agricultural processing results such as Gapek, palm kernel cake and coconut cake. Hydroxycitrate acid {(-)-HCA} has an antiobesity effect by suppressing appetite, giving a sense of satiety, lowering the speed of fat oxidation and lowering the lipid synthesis of *de novo*. The *Garcinia atroviridis* acid (*Garcinia Atroviridis*) has a major active substance of hydroxycitrate acid. [2] Researching the bioactivity of water ethanol extract in this plant is that the extract has antibacterial, antifungi, antioxidant, antitumor, and antimalaria activities. *Garcinia Atroviridis* acid can lower cholesterol [3]. Research [4] suggests that the administration of *Garcinia atroviridis* acid to a level of 1% can increase the percentage of carcasses and components of meat and reduce the carcass of bone components. Based on the research, the addition of *Garcinia atroviridis* acid leaf flour in the feed is

expected to reduce the fat content and improve the duck flavor so that it can increase consumption of people. The purpose of this research is to study the flour-leaf feeding of *Garcinia atroviridis* acid in nonconventional feed on fat content, and fatty acids in duck meat. 68.24 ug/ml) against DPPH free radicals [5]

2 MATERIALS AND METHODS

The study was done five weeks at duck farm of Departement of animal Science, Faculty of Agriculture Djuanda University, Bogor. Sixty rejected duck female local ducks aged 72 weeks were used. A total of 60 rejected duck were distributed according to a completely randomized design into four treatments: R0 : nonconventional ration; R1: nonconventional ration with *Garcinia atroviridis* leaf meal 2%; R2: nonconventional ration with *Garcinia atroviridis* leaf meal 4%; R3: nonconventional ration with *Garcinia atroviridis* 6% With 5 replicates of 3 birds per replicates.

The cage used is a battery cage. During the period of maintenance of ducks will be given rations that are made according to the needs of ducks. The leaf flour of *Garcinia atroviridis* is made by way of: the leaf of *Garcinia atroviridis* acid is crushed first after plucked from the tree, then dried by oven at a temperature of 65°C for 2-3 hours. The provision of *Garcinia atroviridis* acid leaves flour is done daily as needed. The flour is blended evenly into the ration each day and adjusted for treatment.

TABLE 1
RATION COMPOSITION

Feedstuffs	Amount (%)
Yellow Corn	40
Fine Bran	19
Soybean Meal	4,5
Fish Flour	4
DCP 1	0,5
DCP	1
CaCO ₃	1
Coconut Cake	15
Oil palm Cake	15

- Elis Dihansih, Universitas Djuanda, Bogor, Indonesia, elis.dihansih@unida.ac.id
- Dede Kardaya, Universitas Djuanda, Bogor, Indonesia, dede.kardaya@unida.ac.id
- Dewi Wahyuni, Universitas Djuanda, Bogor, Indonesia, dewi.wahyuni@unida.ac.id

TABEL 2
NUTRIENT CONTENT NONCONVENTIONAL RATION FOR TREATMENT

Nutrient (%)	Treatment			
	R0	R1	R2	R3
Ash	8.43	7.71	7.54	7.8
Moisture	11.61	10.74	10.23	9.21
crude protein	13.32	13.08	13.18	12
Crude fat	8.43	7.71	7.54	7.8
Crude fiber	4.25	6.2	8.97	9.3
BETN	59.82	58.51	56.35	57.24

R0 : nonconventional ration; R1 : nonconventional ration with *Garcinia atroviridis* leaf meal 2%; R2 : nonconventional ration with *Garcinia atroviridis* leaf meal 4%; R3 : nonconventional ration with *Garcinia atroviridis* 6%.

The changes observed in the observation of the Ducks performance and duck characteristics are as follows:

1. Analysis of fat content: meat fat levels, meat fat content + skin (AOAC 2005). Testing how to weigh carefully 7-10 grams of meat, put the sleeve in a paper lined with cotton. Donate the paper containing the flesh with a cotton, then put in a Soxhlet tool that has been linked to a fat flask that has been dried and has been known for its weight. Extract it with hexane or a seelma fat solvent for approximately 6 hours. Dry the hexane and dry the fat extract in the drying oven at a temperature of 105°C. Chill and weigh. Repeat this drying until it gets a fixed weight.
2. The composition of fatty acids: Folch (Folch et al. 1956) and methylation to obtain methyl ester of fatty acids using IUPAC Method (1988). The samples used in this test are the breastplate and the flesh and the skin according to treatment.

3 RESULT

TABLE 3
EFFECT OF DIETARY GARCINIA ANTROVIRIDIS LEAF MEAL ADDITION ON FAT CONTENTS IN REJECTED DUCK BREAST MEAT

Parameter	Treatments			
	R0	R1	R2	R3
Meat (%)	20,0±0,4b	12,6±1,5a	15,1±0,5a	13,8±1,0a
Meat +skin (%)	54,2±2,1b	45,1±1,2a	38,9±3,6a	42,5±2,8a

R0 : nonconventional ration; R1 : nonconventional ration with *Garcinia atroviridis* leaf meal 2%; R2 : nonconventional ration with *Garcinia atroviridis* leaf meal 4%; R3 : nonconventional ration with *Garcinia atroviridis* 6%.

The analysis of the variety of fat levels of meat and meat in the skin indicates that the feeding of the *Garcinia atroviridis* acid leaves is real. From table 4 indicates that the total fat meat and meat with skin that is not given sour leaf flour (control) has a higher value compared to the total fat meat and meat with the skin given the treatment of leaf flour *Garcinia Atroviridis* acid up to 6% level. The provision of *Garcinia atroviridis* acid is able to lower the meat fat rate by 31% and meat fat + skin by 23%. HCA in *Garcinia atroviridis* acid increases the oxidation speed of carbohydrates so that the availability of fatty acids to be deposited as an obstructed adipose tissue (de novo synthesis) hereinafter due to the inhibited fat is blocked then

the existing fatty tissues will be oxidized as a source of energy so that an increase in fat oxidation. [5] In addition to the content of coarse fiber rations that are given the *Garcinia atroviridis* acid leaf flour has a higher crude fiber content than the rations that are not given *Garcinia atroviridis* acid leaves. Rations that have a high crude fiber content tend to lower the fat content of meat because more energy is used to digest coarse fibre, with a Denikian no stored fat [6].

TABLE 4
EFFECT OF DIETARY GARCINIA ANTROVIRIDIS LEAFMEAL ADDITION ON UNSATURATED FATTY ACIDS IN REJECTED DUCK BREAST MEAT

	Treatment			
	R0	R1	R2	R3
Myristoleic acid	0,05±0,04	0,01±0,00	0,02±0,00	0,03±0,28
Palmitoleic Acid	1,16±0,18	0,91±0,14	1,13±0,01	1,14±0,47
Oleic Acid	33,68±5,91	26,67±16,75	31,66±0,87	33,19±2,41
Linoleic Acid	10,05±2,10	12,85±0,91	15,33±0,40	10,72±2,68
Linolenic gamma Acid	0,01±0,01	0,00±0,00	0,00±0,00	0,04±0,02
Linolenic Acid	0,25±0,07	0,28±0,02	0,40±0,00	0,21±0,05
Arahidonic Acid	0,15±0,014	1,10±1,14	0,73±0,00	0,33±0,34
TOTAL	45,35±8,31	27,00±18,64	49,28±1,29	45,63±5,00

R0 : nonconventional ration; R1 : nonconventional ration with *Garcinia atroviridis* leaf meal 2%; R2 : nonconventional ration with *Garcinia atroviridis* leaf meal 4%; R3 : nonconventional ration with *Garcinia atroviridis* 6%.

TABLE 5
EFFECT OF DIETARY GARCINIA ANTROVIRIDIS LEAF MEAL ADDITION ON SATURATED FATTY ACIDS IN REJECTED DUCK BREAST MEAT

Parameter	Treatments			
	R0	R1	R2	R3
Caprylic Acid	0,03±0,00	0,02±0,02	0,02±0,00	0,06±0,05
Lauric Acid	1,30±0,59	0,96±0,72	0,68±0,00	0,78±0,68
Myristic Acid	1,49±0,46	1,14±0,43	1,29±0,00	1,06±0,53
Pentadecanoic Acid	0,08±0,01	0,09±0,02	0,10±0,00	0,07±0,01
Palmitic Acid	21,14±1,94	20,64±1,83	20,21±0,49	20,12±0,14
Heptadecanoic Acid	0,95±0,00	0,12±0,06	0,10±0,00	0,09±0,00
Stearic Acid	6,45±1,22	6,94±2,31	4,90±0,07	5,90±1,18
Arachidic Acid	0,19±0,06	0,24±0,10	0,23±0,00	0,18±0,02
TOTAL	30,79±4,32	30,17±3,16	27,53±0,55	28,28±0,01

R0 : nonconventional ration; R1 : nonconventional ration with *Garcinia atroviridis* leaf meal 2%; R2 : nonconventional ration with *Garcinia atroviridis* leaf meal 4%; R3 : nonconventional ration with *Garcinia atroviridis* 6%.

TABLE 6
EFFECT OF DIETARY GARCINIA ANTROVIRIDIS LEAF MEAL ADDITION ON UNSATURATED FATTY ACIDS IN REJECTED DUCK BREAST MEAT AND SKIN

Parameters	Treatments			
	R0	R1	R2	R3
Asam	0.0250±0,00	0,04±0,01	0,04±0,101	0,04±0,00
Myristoleic				

Asam Palmitoleic	0,97±0,09	0,84±1,17	1,29±0,37	0,95±1,34
Asam Elaidic	0,11±0,15	0,00±0,00	0,00±0,00	0,00±0,00
Asam Oleic	28,05±0,92	32,91±6,44	31,94±3,46	30,65±5,84
Asam Linoleic	12,52±3,76	6,39±0,34	9,08±6,33	9,30±7,12
Asam Linolenic gamma	0,00±0,00	0,00±0,00	0,00±0,00	0,01±0,02
Asam Linolenic	0,31±0,07	0,15±0,00	0,19±0,13	0,24±0,22
Asam Arahidonic	0,05±0,01	0,02±0,00	0,05±0,02	0,05±0,02
TOTAL	41,89±4,68	40,36±7,27	42,60±10,35	41,23±14,56

R0 : nonconventional ration; R1 : nonconventional ration with *Garcinia atroviridis* leaf meal 2%; R2 : nonconventional ration with *Garcinia atroviridis* leaf meal 4%; R3 : nonconventional ration with *Garcinia atroviridis* 6%.

TABLE 7
EFFECT OF DIETARY *GARCINIA ATROVIRIDIS* LEAFMEAL ADDITION ON UNSATURATED FATTY ACIDS IN REJECTED DUCK BREAST MEAT AND SKIN

Parameters	Treatments			
	R0	R1	R2	R3
Caprylic Acid	0,08±0,00	0,16±0,08	0,45±0,03	0,15±0,19
3-uric Acid	1,92±0,50	2,35±0,73	1,21±0,20	1,51±0,84
Myristic Acid	1,79±0,19	1,82±0,24	1,45±0,07	1,46±0,52
Pentadecanoic Acid	0,09±0,01	0,08±0,00	0,75±0,00	0,75±0,00
Palmitic Acid	19,74±1,37	20,38±2,49	20,56±0,79	20,52±0,93
Heptadecanoic Acid	0,10±0,01	0,10±0,02	0,07±0,02	0,08±0,01
Stearic Acid	5,62±1,11	5,61±0,74	4,74±0,72	4,27±0,16
Arachidic Acid	0,26±0,06	0,19±0,01	0,22±0,02	0,19±0,01
TOTAL	29,61±3,09	30,71±4,32	28,38±1,18	28,26±2,70

R0 : nonconventional ration; R1 : nonconventional ration with *Garcinia atroviridis* leaf meal 2%; R2 : nonconventional ration with *Garcinia atroviridis* leaf meal 4%; R3 : nonconventional ration with *Garcinia atroviridis* 6%.

The results of various analyses showed that neither saturated nor saturated fatty acids were distinct from the flesh and meat of the skin on all treatments. Total saturated fatty acids in meat range from 20,53-30,79%, total unsaturated fatty acids range between 27,00-49,28%. As for total saturated fatty acids in meat with skin ranges between 28,26-30,71% and total unsaturated fatty acids ranging from 40,36-42,60%. From these results showed a decrease in meat fat does not affect the fatty acid content. Unsaturated fatty acid levels amounted to 60% of the total fatty acids [7]. In this research for ducks that are not given the addition of *Garcinia atroviridis* acid leaf has a level of unsaturated fat as a 72%. Of the total fatty acids. Meanwhile, given the addition of the *Garcinia atroviridis* acid leaves 2%, 4% and 6% respectively at 58%, 64% and 61%. Of total fatty acids.

4 CONCLUSION

Feeding ration contained 2% of *Garcinia atroviridis* leaf meal to the rejected ducks decreased fat content of the meat and meat with skin. However, there was no significant difference in saturated fatty acids and unsaturated fatty acids between

treatments

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REFERENCES

- [1] Direktorat Jenderal Peternakan dan Kesehatan Hewan. 2018. Statistik Peternakan dan Kesehatan Hewan. Kementerian. Pertanian. Republik. Indonesia. Jakarta.
- [2] M. M. M. Mackeen, "Bioassay-guided Isolation, and Identification of Bioactive Compounds from *Garcinia Atroviridis* (Asam Gelugor)," 1998.
- [3] M. S. Hengsa, "Aktivitas Antibakteri Ekstrak Etanol Buah Asam Gelugor (*Garcinia Atroviridis* Griff. Et Anders) Terhadap *Staphylococcus Aureus* Dan *Shigella Dysenteriae* Serta Bioautografinya," 2014.
- [4] N. S. Damanik, "Pengaruh Penambahan Asam Gelugor (*Garcinia Atroviridis*) Dalam Ransum Terhadap Persentase Karkas Dan Komponen Karkas Kelinci Peranakan New Zealand White," Stud. E-J., vol. 3, no. 1, 2014.
- [5] Maimulyati A, Prihadi AR. 2015. Chemical composition, phytochemical and antioxidant activity from extract of *Etlingera elatior* flower from Indonesia. Journal of Pharmacognocny and Phytochemistry. 3(6): 233-238.
- [6] Syukron, M. 2006. Kandungan lemak dan kolesterol daging serta persentase organ dalam ayam broiler yang diberi ransum finisher dengan penambahan kepala 39 udang. [Skripsi]. Program Studi Nutrisi & Makanan Ternak, Fakultas Peternakan, Institut Pertanian Bogor. Bogor.
- [7] Estevez, I., 2007. Density allowances for broilers: Where to set the limits? Poult. Sci., 86: 1265-1272.

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