

Comparative Study on Fat and Cholesterol Contents of Shredded Beef and Buffalo Meat

(Studi Perbandingan Kandungan Lemak dan Kolesterol Abon Daging Sapi dan Kerbau)

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Abstrak

Penelitian ini bertujuan untuk membandingkan kandungan lemak dan kolesterol abon daging sapi dan kerbau antar umur ternak. Sampel daging diambil pada bagian paha belakang (*rump*) dari sapi jantan, kerbau jantan dan kerbau betina yang dipotong di RPH Pemalang. Ternak dibedakan atas umur muda dan tua dengan 4 (empat) kali ulangan. Peubah yang diamati adalah kandungan lemak dan kolesterol. Data yang terkumpul dianalisis ragam dengan pola tersarang (*Nested Classification*), sebagai grup adalah jenis ternak (sapi jantan, kerbau jantan dan kerbau betina). Sub grup adalah antar umur dalam jenis ternak (muda dan tua). Analisis ragam menunjukkan kandungan lemak antar jenis ternak menunjukkan perbedaan nyata ($P < 0,05$) sedangkan antar umur ternak menunjukkan perbedaan sangat nyata ($P < 0,01$). Pada kandungan kolesterol, menunjukkan antar jenis ternak tidak berbeda nyata. Hasil penelitian dapat disimpulkan bahwa kandungan lemak dan kolesterol abon daging sapi dan kerbau tidak menunjukkan perbedaan sehingga daging kerbau dapat digunakan sebagai alternatif penyediaan abon daging.

Kata Kunci: Lemak, Kolesterol, Sapi, Kerbau

Introduction

Generally, human beings need the nutrient in their food, namely: water, proteins, carbohydrates, vitamins, minerals and fats. Meat is one of the animal proteins that are rich in proteins, irons, vitamins and fats so it can full fill most of human needs.

One of the efforts to realize meat self-sufficiency to develop the potential of local livestock, cattle and buffalo are superior local farm animals that will be developed beside goat, sheep, chicken and duck.

Decreasing interest to raise farm animals constrained developing of buffalo livestock. This is because the function of buffalo as an agriculture workforce begins to be changed with tractor and its low productivity. Consumers do not like buffalo meat. In order that meat is ready to be consumed, it needs a processing such as boiling, frying or being transformed to other products such as shredded and chopped meat.

Shredded meat is meat that has been processed and still being made traditionally in high temperature, water reduction and seasoning addition. Shredded meat feels

like cotton that contains pieces of meat because made it is from skeletal muscle that is formed from the stripped muscle.

Quality of meat is valued from the physical composition and is valued from chemical composition such as fat and cholesterol. Fat and cholesterol contents are different between cooked meat and raw meat because some changes may occur during the process.

This research was done to know the differences in fat content and cholesterol content of the shredded meat buffalo and cattle.

Research Methods

Materials that were used in this study were rump meats of the PO bull, male and female buffaloes from 4 young bulls, 4 old bulls, 4 young male buffaloes and 4 old female buffaloes that were slaughtered at RPH Pemalang. Each 20 grams type of the meat was taken, i.e. from different ages and types of the animals.

The making of shredded meat was based on the procedure that was developed by

Ningsih (2000). The data of fat and cholesterol contents were obtained from sample analyses for fat and cholesterol contents using the method of soxhlet and Liberman Buchard (AOAC, 1970).

The collected data were analyzed further, using Nested Classification, as group was types of livestock: bull, male buffalo, and female buffalo. As sub group was ages of livestock: young (2-3 years old) and older (more than 3 years old). Every sample was repeated 4 times. The statistic variables that were studied were cholesterol and fat contents (in percentage).

Mathematic model that was used :

$$Y_{ijk} = \mu + \alpha_{(i)} + \beta_{(j)} + \epsilon_{(ij)k}$$

Y_{ijk} = fat and cholesterol contents

μ = the value of population mean

$\alpha_{(i)}$ = the treatment effect

$\beta_{(j)}$ = the ages and types of animal effects

$\epsilon_{(ij)k}$ = the sum of error of all treatments

If F test showed significant differences, further test LSD, was required further.

Results and Discussion

Fat

The fat content data obtained from the sample analyses using Soxhlet method were shown in Table 1. The analyses of variance indicated that there was no difference in fat content between livestock types but between livestock ages indicated the significant differences ($P < 0.01$).

Based on the LSD test the fat contents of young bull with old bull shredded meat did not indicate any significant differences, as it was true with the young male buffalo with the old male buffalo.

In the female buffalo, the fat contents of young livestock shredded meat (17.03 ± 1.57 percent) significantly difference ($P < 0.01$) to the old livestock shredded meat (11.67 ± 2.02 percent)

In Table 1 the fat contents of young bull shredded meat was higher than the old bull, as it was true for the female buffalo. This was not in accordance with Soeparno (1994) who explained that in the living animal, fat was piled as during the growth and development, so the older the ages, the greater fat carcass percentage.

However, the increase in ages is not always followed by the increase in fat content, consumption exceeds the energy requirements for basal life and protein disposition (Emery, 1969; Berg and Butterfield, 1976; Soeparno, 1994). Anggorodi (1990) explains that fat percentage is generally increase in accordance with the increase in ages but it always changes every time depends on the quality of feed consumption. The fat reserve that is piled in the body is not only formed from the consumed but also comes from carbohydrates and proteins. According to Lawrie (1974) there is higher fat contents in livestock that are given a highest quality of nutrition than those given the lower quality of nutrition.

Zianuddin *et al.* (1994) explains that young buffalo meat has lower collagen which means that young buffalo meat has higher fat contents than the old one. The material that was used in this research was a young buffalo in the ages of 1-2 years and 12 years.

The fat contents of young livestock shredded meat were the activity differences.

Table 1. The Fat Content Average of Shredded Meat of Beef Cattle and Buffalo.

Livestock Types	Ages	Fat Contents (%)	
		Averages	Standard Deviation
Bull	Young	17.01	0.57
	Old	14.32	3.24
Male buffalo	Young	19.90	2.60
	Old	20.67	3.45
Female	Young	17.03	1.57
	Old	11.65	2.02
	Average	16.76	2.24

Table 2. The Means of Cholesterol Contents of Cattle and Buffalo Shredded Meat.

Livestock Types	Ages	Cholesterol Contents (%)	
		Averages	Standard Deviation
Bull	Young	0.27	0.06
	Old	0.19	0.05
Male buffalo	Young	0.13	0.00
	Old	0.16	0.01
Female	Young	0.18	0.01
	Old	0.22	0.00
Average		0.19	0.02

According to Wello (1996), muscle with high activity has lower fat content than muscle with low activity. The old livestock has highest activity because it has been used as a work force for long period of time, which may cause the fat contents of its meat to be lower (Sorensen and Tribe, 1992).

Cholesterol

The fat contents data from the sample analyses using Liberman-Buchard method were provided in Table 2. The analyses of variance indicated that there were no differences in cholesterol contents between livestock types but between livestock ages, indicated highly significant differences ($P < 0.01$).

Based on LSD test the cholesterol contents of young male buffalo with old male buffalo shredded meat did not indicate significant differences, as it was true for the young female buffalo with the old female buffalo. In bull, the cholesterol content of young livestock shredded meat (0.27 ± 0.06 percent) was significantly difference ($P < 0.01$) compared to the old livestock (0.19 ± 0.05 percent).

In Table 2 the cholesterol contents of young bull shredded meat was higher than the old one. According to Wello (1996), there is a positive correlation between the degree of marbling with carcass fat. High fat content correlated positively with high marbling. Muscle with high marbling will also contain higher cholesterol.

However this condition did not occur in female buffalo. Female buffalo had a high fat content whereas the cholesterol content was low, indicated that there was no positive correlation. Cholesterol concentration in tissues may be depending

on the quantity of tissues needed for the function cellular membrane (Soeparno, 1994) and the differences in the physiology of the tissues (Purchas *et al.*, 1980).

Conclusions

The fat content of shredded meat of buffalo is not different with the beef cattle. The cholesterol content of shredded meat of buffalo is not different with the beef cattle. The fat and cholesterol contents of shredded meat of young livestock were higher than those in old livestock.

The research results indicated that the fat and cholesterol contents of shredded meat of bull and buffalo was not different, it's meant that buffalo meat was as good as the bull meat. Related with this condition, so it is important to give information be done to the people as a first step to develop the buffalo meat processing to become shredded meat, as an alternative to provide shredded meat other than shredded meat made of beef.

References

- Anggorodi, R. 1990. Ilmu Makanan Ternak Umum. Gramedia. Jakarta.
- AOAC. 1970. Official Methods of Analyses Association of Chemical. Association of Official Agriculture Chemist, Inc. Washington DC.
- Forrest, J.C., E.D. Aberle, H.B. Hedrick, M.D. Judge and R.A. Merkel. 1975. Principles of Meat Science. W.H. Freeman and Company, USA.
- Lawrie, R.A. 1974. Meat Science. Second edition. Pergamon Press, Germany.

- Ningsih, D. 2000. Pangan Olahan dari Produk Ternak. Fakultas Peternakan Unsoed. Purwokerto.
- Purchas, R.W., B.W. Butler-Hogg and A.S. Davies. 1989. Meat Production and Processing. Simon Print. New Zealand.
- Soeparno. 1994. Ilmu dan Teknologi Daging. Gajah Mada University Press. Yogyakarta.
- Sorensen, A.N. and D.E. Tribe. 1992. World Animal Science: Buffalo Production. Elsevier Science. Nederland.
- Wello, B. 1996. Pengaruh Kombinasi Perkawinan dan Lokasi Otot terhadap Jumlah dan Komposisi Kimia Lemak Daging. *Buletin Peternakan dan Perikanan IV (10): 68 – 78.*
- Zianuddin, K.S., N.S. Mahendrokar, D.N. Rao, B.S. Ramesh and B.L. Amla. 1994. Observations on some chemical and physical characteristics of buffalo meat. *Meat Science. 37 (1): 103 – 113.*