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THE EVALUATION OF NUTRITIONAL VALUE OF AND OF RENDANG MINANGKABAU (PRELIMINARY RESULT)



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INTRODUCTION

Rendang is the spicy meat dish wich originated from Minangkabau ethnic in Indonesia, and now commonly served across the country. In 2011 Cable News Network (CNN) viewers choose rendang as number one dish of their "World's" 50 Most delicious Foods.



The basic ingredient of rendang are:
meat, coconut milk and many kind of spices such as: redpepper, onion, garlic, ginger, galangal, coriander, blackpepper, clove, nutmeg, cumin, turmeric leaf, bay leaf, kaffir lime leaf, and lemon grass

CULTURAL AND HISTORICAL ASPECTS OF RENDANG

In Minangkabau tradition rendang is a requisite dish for special occasion in traditional Minang ceremonies, such as giving birth ceremonies, marriage, religious festival and is served to honor special guests.



Rendang began to spread across the region when Minangkabau merchants and migrant workers began to trade and migrate to Mallaca in 16th century. Because the journey took much time (river waterways), so rendang is suitable for long journey (Prof. Gusti Asnan)



Rendang Minangkabau if cooked properly still good to consume until 3 weeks in room temperature , even last for months if stored in refrigerator and up to six months if frozen.



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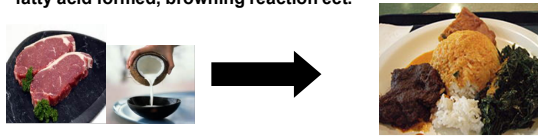
Rational of research

- Rendang has been produced and consumed for centuries in Minangkabau and also became preference and widely consumed by people from other ethnic groups in Indonesia (through Padang Foods Restaurants existed all over Indonesia). Even, internationally, rendang has been recognized as one of the most delicious foods in the world (CNN Viewers 2011).
- However, there is no scientific research yet conducted to understand better the characteristics of aromatic components and nutritional value of rendang, therefore it is necessary to do a systematic research to develop knowledge on rendang as food for many.
- This research aim at evaluating the nutrional value and characteristic of aromatic components of rendang so that it can give information to consumers, producers, and for knowledge generation on this subject.
- This paper will provide report on the pleminary results of analysis on nutritive value of protein in rendang.

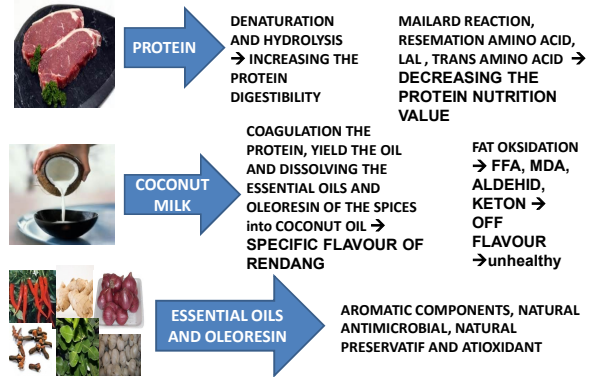
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LITERATURE REVIEW

- Food processing aim to convert the raw food into edible food and to increase the shelf life of product.
- Food processing can change the nutritional component into positive and negative in nature, because they are sensitive by heat, acid, and alkaline .
- The nutritional changes happened because of the chemical reaction process in food especially protein and fat, such as denaturation, amino acid cross linkage, amino acid rasemation, lisiinolalanin formed, oxidation of fatty acid, hidrolisis, trans fatty acid formed, browning reaction ect.



PROTEIN AND FAT CHANGE WHILE COOKING PROCESS



Herbs and spices known as natural antioxidant, antimicrobial, natural organic preservatives and even as a functional food.



Herbs and spices have a volatil (essential oil) and non-volatil (oleoresin) component where can absorb by the meat and dissolved in creamy souce and oil.

The generous and numerous of herbs and spices used in Rendang Minangkabau make the rendang have a complex and unique taste and durable food or perishable food.

METHODOLOGY COOKING PROCESS OF RENDANG

All ingredients (meat, coconut oil, spices) put in the pan and heat slowly with temperature (80 – 93 °C) and (6-7 hours)

While cooking process the all ingerdients stirred and turn over untill the liquid evaporated and the dish became dry and the color turn to dark brown or black.

Base on the water content there are 3 types of product :

GULAI → water content about 60 – 65% (yellowish)

KALIO → water content about 45– 50% (brownish)

RENDANG → water content about 28– 32% (dark brownish)

OVER ALL → 6 HOURS



Objective of the research

1. Evaluate the nutritional value of rendang (protein)
2. Evaluate the protein digestibility (in-vitro)
2. Characterize the amino acid of protein by HPLC

→ Research still on-going (in progress), this is a presentation of PRELIMINARY RESULTS.

Preliminary result

PROXIMATE ANALYSIS OF FRESH MEAT, KALIO MEAT AND RENDANG MEAT

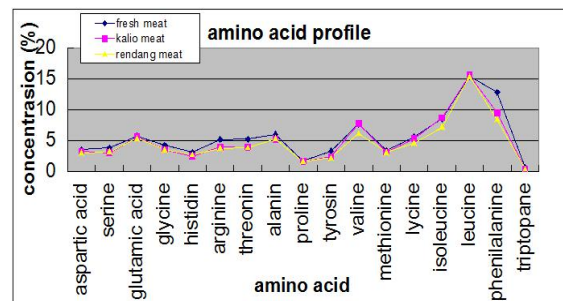
Parameter Product	Water content (%) (average ± SE)	Protein (%) (average ± SE)	Fat (%) (average ± SE)	Ash (%) (average ± SE)
Fresh meat	72.46 (0,11) a	22.26 (0,065)c	0.95 (0,03) c	1.16 (0,275) c
Kalio meat	46,43 (0,10) b	33.71 (0,105) b	8.76 (0,02) b	2.48 (0,10) b
Rendang meat	29.87(0.02) c	41.86 (0.07) a	14.80 (0.05) a	3.60 (075) a
p < 0,05				

PROTEIN DIGESTIBILITY (in-vitro)



Product	Fresh meat	Kalio	Rendang
PROTEIN DIGESTIBILITY	74.5 (± 0.09) a	73.14 (± 0.043) b	71.80 (± 0.06) c
p < 0,05			

Concentration of amino acid (HPLC)



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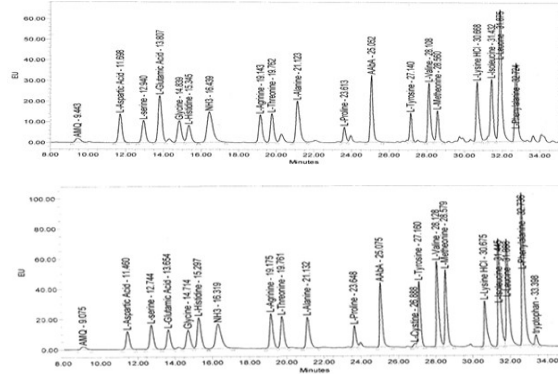
Concentration of Amino acid

Tabel 2. Concentration of amino acid from fresh meat, kalio meat and rendang meat (%)

Amino acid	fresh meat (%)	kalio meat (%)	rendang meat (%)
L-aspartic acid	3.56	3.29	3.05
L-serine	3.83	3.06	3.20
L-glutamic acid	5.79	5.62	5.38
Glycine	4.33	3.61	3.53
L-histidine	3.13	2.49	2.72
L-arginine	5.22	3.98	3.79
L-threonine	5.27	3.93	3.90
L-alanine	6.08	5.24	5.37
L-proline	1.71	1.66	1.65
L-tyrosine	3.37	2.4	2.28
L-valine	7.70	6.16	
L-methionine	3.44	3.18	3.10
L-lycineHCl	5.62	5.36	4.63
L-isoleucine	8.53	8.24	7.20
L-leucine	15.39	15.62	15.38
L-phenylalanine	12.83	9.53	8.45
L-tryptophan	0.764	0.45	0.44

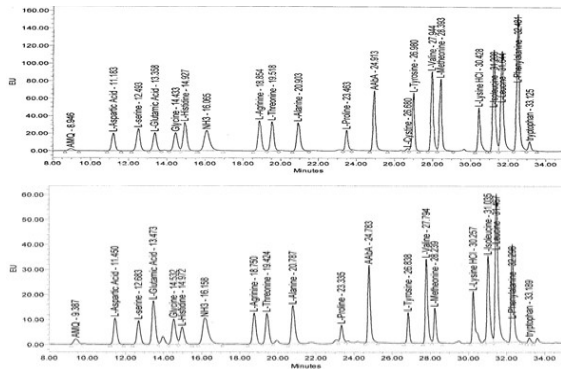
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Amino acid Profile of Fresh meat (HPLC)



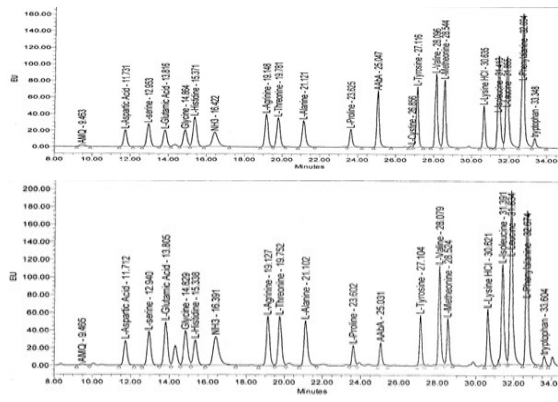
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Amino acid Profile of Kalio meat (HPLC)



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Amino acid profile of Rendang meat (HPLC)



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CONCLUSION

1. The nutritional components of "kallo" and "rendang" are changed, the protein, fat, ash and carbohydrate are increased compare to the fresh meat. The nutritional components of fresh meat are: water content 72,57%, protein 22,26%, fat 0,95%, ash 1,16 and carbohydrate 3,06%. The nutritional components of Kalio are water content 46,43%, protein 33,71%, fat 8,76%, ash 2,48 and carbohydrate 8,62%. And the nutritional components of Rendang are water content 29.87%, protein 41.866%, fat 14,80%, ash 3,60 and carbohydrate 9.87%.
2. The digestibility of protein (in-vitro) decreased from 74,59% (fresh meat), 73,14% (kalio) and 71.80% (rendang).
3. There are 17 of amino acids were found in fresh, kalio and rendang meat, and the concentration of amino acids are decreased from 0,1% until 32% from fresh to kalio and rendang meat, over all average of decrease are 12% and 14%

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THANK YOU

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