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Ethnozoological Study on Sasak Cuisines: Diversity, Utilization, Social, Cultural and Nutritional Aspects

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ABSTRACT

An ethnozoological study on local cuisine of Sasak tribe in Lombok Island, Indonesia, was carried out. The aims of this study are to explore, to record, and to analyse the utilisation of animals in Sasak cuisine from ethnozoological aspects as a part of efforts in environmental and cultural preservation. Data are collected through direct observation, participatory-observation, interviews and literature review. In the 34 dishes recorded, there are about 131 animal species belonging to 114 genera and 83 families that are used as main or additional ingredients in Sasak cuisines. Fishes contribute the highest number of species, and *Gallus gallus domestica* has the most reported uses. Animals are also used in most of traditional rituals related to foods, and play a significant role in people's social-cultural life. People appreciate animals not only due to their role as food or as helper in agricultural and transportation activities, but also as a means to maintain a good balance between humans, environment, and spiritual needs.

INTRODUCTION

Indonesia is one of the countries that rich in culture and natural resources. By having 247 tribes, Indonesia has an incredible asset in culinary to be explored and introduced, including various local knowledge contained in it (Marliyati et al., 2013). The use of animals in local cuisines is a reflection of how people use and manage the animal resources in their daily life. Sasak is the original tribe who live Lombok Island in West Nusa Tenggara, Indonesia (Krulfeld, 1972) and posses the various cuisines that have been known, made, and consume by local people since a very long period. Sasak cuisines have a unique taste and flavor, and use the specific local ingredients included various plants and animals (Widyastuti et al., 2010). In culinary culture, written knowledge can never completely replace oral communication, but it can support innovation, new forms of oral communication, and efforts to preserve the genetic diversity of food resources (Matthews, 2004).

The aims of this study are to explore, to record, and to analyze the utilisation of animals in Sasak cuisines from ethnozoological aspects. This research is also expected to give a significance contribution to ethnobiological disciplines, especially as an effort in cultural and environmental preservation.

MATERIALS AND METHODS

Field research is conducted with a purposive sampling method (Tongco, 2007). Data are obtained through direct observation, participatory-observation, interview, and literature review (Cotton, 1996; Martin, 2007). Semi-structured and open-ended interviews are directed to 120 informants chosen from 42 villages in 26 sub-districts of four districts and one municipality in Lombok island (West Lombok, East Lombok, North Lombok, Central Lombok, and Mataram city), based on snowball method (Endraswara, 2006). Research areas and villages where informants and information come from are shown in Fig. 1.

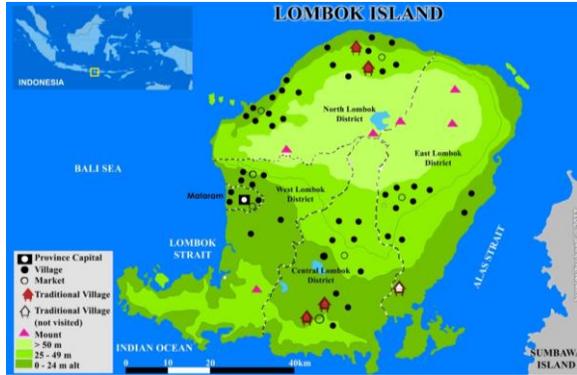


Fig. 1: Map of Lombok Island, West Nusatenggara, Indonesia (Source: Lombok Axis, 2016).

Information is obtained on ethnozoological aspects of local cuisine such as kinds of dishes, ingredients, preparation method, and also the utilization of animals related to food and cultural rituals. Biplot analysis for nutritional data is conducted using Paleontological Statistics (PAST) program version 2.17, supported with data arranged based on Table of Indonesian Food Composition (Persagi, 2009). The 'local cuisines' that are observed are dishes that contain animal as ingredients, which Sasak people themselves consider have been known, made, and consumed by their family or community for a long time, which are usually prepared with local ingredients and are adapted to local taste. All data is analysed thoroughly using descriptive and qualitative approaches.

RESULTS

Animal diversity used in Sasak cuisines

Based on observation, there are 131 species belonging to 114 genus and 83 families used in Sasak cuisines, consisting of fowls, mammals, aquatic species, insects, annelids, and some minor categories. The most common fowl utilized by people are manok or chicken (*Gallus gallus domesticus*) and bebeq or duck (*Anas platy rhyngos*), either captured for the meat or eggs. Other fowls are bird, bubut or quail (*Coturnix coturnix*), and dare or pigeon (*Columba livia*), in non-significant amount. People distinguish between two types of chicken, ayam ras (broilers and laying hens) and ayam kampung (village chicken). Ayam ras is reared with specific method to produce meat or eggs, meanwhile ayam kampung is left to roam freely at homeyards or in the villages, with non-specific feed. Ayam kampung and its eggs are also used as symbols and offerings in various rituals.

Sampi (*Bos taurus*), kaoq (*Bubalus bubalis*) and bembeq (*Capra aegagrus*) are three mammals that mostly used in Sasak cuisines. Sampi and kaoq are also used as offerings in cultural ceremonies, and as an

investment. Animal Husbandry Department of West Nusa Tenggara Province records the population of pig, sheep, and rabbit, but those animals have less utilization in Sasak cuisines. Horses are more often used in traditional transportation such as cidomo or cikar than used as food. A dish made from horse meat known by people is bebalung jaran (horse bones soup). Deer is rarely used in daily menu, and is also one of the preserved animals in Indonesia.

More than 90% of animal species used in Sasak cuisines were inland and marine fishes. Three families with the most species were Scombridae (10 species), Carangidae (9 species), and Clupeidae (8 species). People distinguish two types of fishery, inland and marine fishery. Habitats for inland fishery are mainly rivers, ponds, *embung* (little pond), and paddy fields. Species caught in those areas usually are river shrimps, *Parathelphusa convexa*, *Anabas testudineus*, *Oreochromis mossambicus*, *Monopterus albus*, and *Clarias batracus*. Fishery products are also used in traditional trading (*bedea*) in some areas in Southern and Northern Lombok, in which fishes will be changed with agricultural products such as coconut, corn, and cassava. Productive areas are Lombok strait (mackerel tuna), southern part of Alas strait (squids, sharks, and stingrays), Gili Air (shrimps), and Southern Lombok waters (squids). Large scale harbours for selling fishes are Tanjung Luar, and Labuhan Lombok (East Lombok) for fishes caught from west coast of Sumbawa, and Ampenan (West Lombok) for fishes caught from Lombok strait. *Euthynnus affinis* is one of the most common fishes traded in local market, either in fresh or preserved condition, and is available in all season. Fishes are also sold as preserved fish such as salty-fish, smoked-fish, or dried-fish.

The hunting of some marine animals is prohibited by Indonesian Government due to their conservation status according to International Union for Conservation of Nature (IUCN) Red List (Baillie et al., 2004) and Indonesian Government Regulation No. 07 in 1999 about Preservation of Plants and Animals Species (Republik Indonesia, 1999). Several marine animals in Lombok that are listed are *Chelonia midas*, *Eretmochelys imbricata*, and some species of sharks, such as hammerhead shark, manta rays, saws shark, and others. Turtle hunting used to be done around southern and northern coast of Lombok (Teluk Sepi and Teluk Blongas), southern coast of Sumbawa Island, and around west coast of Lombok (Gili Air, Gili Meno, dan Gili Trawangan). In the past time, *Chelonia midas* in Lombok waters was caught by Balinese fishermen, to be used as offering meals in Balinese traditional rituals. Turtle's meat can be prepared as *satay* (grilled meat), the eggs are used as vitality supplement, and the *carapace* are used for making souvenirs. Center for sharks trading in Lombok is Rumbuk village, East

Lombok Regency. Sharks that are still allowed to be caught today are *hiu botol* (*Centrophorus squamosus*) and *hiu betok*.

Insects are consumed only as emergency food, especially during the long drought in the past or due to the abundance of certain species, such as some species of grasshopper, *Leptocorisa acuta*, and *Apis* sp. In Central Lombok regency, some people use the bee hive as an alternative ingredient in making *pereseng* (hot and sour soup). Annelid that is used as food is *nyale* or sea-worm (*Eunice sicilensis*), a Polychaete that appears once a year around February due to its reproduction-cycle at the southern coast of Lombok. People celebrate this event by doing *bau nyale* (worm-catching) ritual. Local people connect this event with an old mythe called *Putri Mandalika*, a princess who turned into a worm or *nyale* after committed suicide by plunged into the sea. *Nyale* is used as natural fertilizer and medicine, and is cooked into *kelak moren* (worm soup with grated coconut). *Nyale* that has been salt-fermented can be used as natural seasoning by adding it during cooking.

Animal utilization in Sasak cuisines

The diversity of Sasak cuisine containing animal ingredients is shown in Table 1. There are 34 dishes of Sasak cuisines using animals either as main ingredients or additional ingredients. Animals with the most kinds of possible utilization are accordingly: chicken (16 dishes or 47.1%), cow (12 dishes or 35.3%), fishes (10 dishes or 29.4%), buffalo (8 dishes or 23.5%), seafood (4 dishes or 11.8%), lamb (3 dishes or 8.8%), and others (2 dishes or 5.9%). Meat (cow or buffalo) is usually used as side dishes to complete rice and vegetables, and most are seasoned with four basic spices mixture called *ragi beleq*, *ragi rajang*, *plecingan*, and *pelalah*. Generally, Sasak cuisines get much influence from Bali cuisines in term of kinds of food, taste and flavor, role of the food, and way of eating. Other influences are gotten from Javanese and Arabian food.

The simplest way to cook meat is by frying, especially for chicken, fish, shrimp, and squid. Other ways are boiled with coconut milk and various spices as curry (such in *kelak santen*, *pelalah*), grilled as *satay* (marinated meat or chicken skewered on coconut leaf-rib sticks, then grilled over charcoal fire), baked, and some simple fermentation for food preservation.

Several dishes that are usually provided in certain rituals or ceremonies are *ayam merangkat*, *opor*, *ebatan*, *bebalung*, *sate pusut*, *sate luh luh*, and *timbang janganan*. Several dishes such as *sambel kenango* (chilli sauce with rice earhead bug), fried grasshopper, and bee hive soup, are only served in emergency condition or due to the abundance of the species. Certain dishes are consumed by people for maintaining health or healing diseases, for examples are *pelecing lindung* (eel with chilli sauce) to prevent anemia, *lamb* dishes to increase

Table 1: Sasak cuisine containing animals pecies as ingredient

No. Dishes	Possible Animal Ingredient
1 Lawar	cow, buffalo
2 Kelaqsantenragibeleq	chicken & egg, lamb, cow, horse
3 Pelalah	chicken & egg, cow
4 Opor	chicken & egg
5 RagiRajang	fish, chicken, squid
6 Pelecingan	chicken, fish, eel
7 Sambelkenangu	rice earhead bug
8 Sop	Chicken
9 Bebalung	cow, buffalo, horse
10 Reraon	cow, lamb, buffalo
11 Berengkes	marine fish, shrimp, crab, freshwater crab
12 Sate pusut	cow, buffalo, fish
13 Sate luhluh	marine fish
14 Sate bulayak	cow, chicken, land snail
15 Sate ampet	chicken, buffalo, lamb
16 Sate Rembiga	Cow
17 Rarit	cow, deer
18 Sit-sit	cow, buffalo
19 Timbungjangan	cow, buffalo
20 Pindang	marine fish
21 Teloquekasem	duck egg
22 Ayammerangkat	Chicken
23 Kelakmoren	sea worm
24 Goreng	chicken, fish, shrimp, squid, octopus, bird, grasshopper, land snail, apple snail, duck
25 Bakar	chicken, fish, shrimp, squid, octopus
26 AyamTaliwang	Chicken
27 AyamRarang	Chicken
28 AyamJulat	Chicken
29 Manoqseraten	Chicken
30 Soto	chicken & egg
31 Kime-kimedaging	Cow
32 Gegeri/empakpekasem	fish, octopus, eel
33 kerupukkulit	cow, buffalo, shark
34 Others (rebus, tumis, santan)	sea snail, shrimp, squid, crab, land snail, octopus, fish, horse

Source: field observations.

blood pressure, and *bebalung* (bone ribs soup) to supply energy.

To ensure the food availability and to make solution for the abundance of livestock and fowls production, people preserve their food using simple fermentation technics. Some of fermentation products are *teloq pekasem* (salty egg), *empak pekasem* (dried fish), *gegeri* (dried fish), and *rarity* (dried meat). *Teloq pekasem* are duck-eggs marinated by wrapping the eggs with husk ash mixed with barks of *Moringaoleifera*, *Hibiscus tiliaceus*, *Cocosnucifera*, and rhizome of *Alpinia galanga*, for about 14 days. Preserving food by salting are also applied to marine fishes, and this product is called *empak pekasem* or *empak palem*. Pieces of cut-fish are marinated using salt and fruit of

Tamarindus indica for one night. Another kind of preserved fish are *gegeri*, where fishes are marinated using salt and *Tamarindus indica*, kept for a night, and then dried under the sunlight. This product is consumed after being fried or grilled. Similar product that use cow or buffalo is called *rarit*, but is processed without *Tamarindus indica*. *Rarit* is consumed after being grilled, flaked, and then fried. Another fermentation products is a natural seasoning made of fermented *nyale* (sea worm), and *terasi*. *terasi* is made of *masin* or tiny shrimps boiled with salt, dried, and kept for certain period of time until well-fermented, and is frequently used in many dishes to give the distinctive taste of Sasak cuisines.

Animals in social cultural aspects

In social-cultural side, animal utilizations are applied in various ceremonial events, either used as offerings or dishes provided for the guests. Most people in Lombok Island are Moslems, but ancestral beliefs that are closely related with animism and dynamism are still embraced by some Sasaknese. The followings are rituals and ceremonials which involve animals in terms of food utilization:

Nutritional aspects

Sasak cuisines also have numerous nutritional potentials which are required for health. The following is the graphic of biplot analysis between the main dishes and nutritional content (energy, protein, fat, carbohydrate, thiamine, vitamin C, calcium, phosphor, and ferrum), calculated based on 100 gr raw ingredients listed in table of Indonesia Food Composition released by Persagi (2009).

The graphic plot shows that the first quadrant consists of dishes characterized by significant carbohydrate, vitamin C, calcium, and ferrum content (soto, timbung jangan, pelalah, sambel kenagu). Soto consisted of several vegetables as vitamin C and calcium sources, and so did sambel kenangu as chili sauce condiment. Pelalah contains milk coconut that contributes the ferrum content, mean while timbung jangan is made from glutinous rice that act as carbohydrate source. The second quadrant (right-above) consists of dishes characterized with significant fat and energy content, because most dishes are made from chicken and meat. The third quadrant (right-below) shows that opor (chicken curry) and sit-sit (shredded meat) are good protein sources, meanwhile the rest of

Table 2: Rituals and ceremonies which involve animals in terms of food utilization:

No.	Rituals and ceremonies	Animal utilization
1.	Mangan merangkat	Dining together at the night when a lady 'has been stolen' to be married (<i>merariq</i>) by a man. The dish served in this event is called <i>ayam merangkat</i> , roasted chicken served with white rice, chicken egg, and <i>kelak sondaq</i> (<i>Lagenaria siceraria</i> soup)
2.	Pelengkak	A fine (usually is a buffalo) that should be paid when a man married a woman while the woman's elder sister is not married yet.
3.	Gantiran	A kind of ceremonial fee that should be paid by a man to the woman's family, submitted along with agricultural products such as rice, coconut, coconut oil, fire wood, and also money.
4.	Labuhan	A ritual conducted when the yield of marine fishery does not meet the expectations. People make <i>ketupat</i> (cooked rice wrapped in coconut leaves) and slaughter a buffalo to be cooked. The buffalo's head will be drifted to the sea as a sacrifice, with a hope that marine fishery will give a good yield.
5.	Rebo Bontong	A buffalo's head drifting ritual for refusing reinforcements, held once a year on the last Wednesday of Sapar month based on Islamic calendar. This ritual is a kind of Hinduism and Moslem acculturation in Sasak tradition.
6.	Memare or mangan brenge	A tradition of three-night stay at the seashore with family for recreation and fishing. Fishes are eaten together, and parts of them are dried and saved as food supply.
7.	Membole	Plowing the paddy field using dozens of buffalo or cow by releasing them in the watered land.
8.	Menggara	Plowing the paddy field using <i>lenggara</i> (plow) pulled by a pair of cows.
9.	Maleang	A traditional game where people racing their cows in the muddy paddy field as a kind of people's gratitude for their harvest.
10.	Bait masa or pemomon	A ritual for determining the time for paddy harvesting. A dish served in this ritual is <i>tontong aus</i> , consists of rice and egg cooked in a clay pot. Farmer's family may also serve <i>ketupat</i> (rice wrapped in coconut leaves), <i>tekel</i> (glutinous rice wrapped in <i>Arenga</i> 's leaves), and <i>sambal saur</i> (a dish with grated coconut).
11.	Tahlilan	A praying ritual that serves meals used as praying accompaniment, consisting of animals and plants.
12.	Akad nikah	Part of wedding ceremony, using meals as praying accompaniment.
13.	Bau nyale	<i>Nyale</i> or sea-worm (<i>Eunice siciliensis</i>) collecting. <i>Nyale</i> is used for food, fertilizer, and medicine.
14.	Menyowok	A kind of mistakes redemption ritual by slaughtering a buffalo and two chickens (black and white-feathered each). Their blood will be spread around the village, and the buffalo's head will be floated out to the sea.

food availability. It is also a kind of knowledge about increasing delicacy and appetite in eating.

Several influences from other region in food might be caused by colonialism. Sasak people had ever been under the rule of Majapahit (Java) kingdom during 15th and 16th century, and also of Karangasem (Bali) kingdom during 1740 until 1895 (Amin et al., 1997). Culinary often carry with them the traces of their colonized pasts. Food and eating is one of important aspects that had close involvement in people's daily needs and activities, so it might be easily got much influence from any occasion in society. It was the role of local genius owned by the community that sorted what kind of influences to be accepted and adopted in their life, such as some cooking practices and recipes in colonized country (Rahman, 2011; Esterik, 2008).

In social-cultural aspects, the role of animal is as part of efforts in keeping the balance of life. The material or spiritual relationships between humans and animals has made the traditional or zoological knowledge exists in all cultures in the world. According to Alves (2012), mythologies have been present throughout human history and played a significant role in people's life, and may give positive aspect in the interrelationship between humans and animals as they make people and human societies promote a deep respect for animals, due to their spiritual value. Historical and social-cultural background has also given much influence to people's beliefs system, and was implicated in several traditional ceremonies. The biplot analysis on nutritional content more or less gave a profile and guideline about what kind of food could be chosen if people expect a certain nutrient intake. Grouping and vectors had mapped the dishes that were characterized by significant content of energy, protein, fat, carbohydrate, thiamine, vitamin C, calcium, phosphor, and iron. The biplot analysis result also recommend that dishes in left-below quadrant should be combined with other dishes to be able to supply significant nutrient intake.

Conclusions

In general, it can be concluded that Sasak cuisines in term of animal diversity, utilization, social-cultural, and nutritional aspects contain important local knowledge that should be revealed, introduced, preserved, and improved wisely in people's lives. Traditional food is not only food that used for fulfilling people's physical needs, but also is an important heritage containing local wisdom that should be known by the next generation. Ethnobiological research can be a tool for revealing, introducing, and preserving not only the natural resources used in people' live, but also the local knowledge and cultural heritage owned by many communities in the world.

Authors' contribution

KS was the principal researcher who conceived the idea, and wrote the manuscript. LH helped in designing the project and supervised the fieldwork. YP assisted in designing the methodology and SI helped in biplot analysis and writing the manuscript.

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