

## Food Consumption of Livestock Products by Household Coast In South Bolaang Mongondow Regency, North Sulawesi, Indonesia

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### Abstract

Food consumption from animals tends to increase due to the improving economic condition of people from a region. In addition, increased public awareness of nutrition can lead to increased consumption of food including animal food from livestock. The problem is that coastal communities are low-income people, resulting in a tendency to consume low livestock products. This research has been conducted with the aim to know the amount of income and consumption of livestock products (meat and egg) in South Bolaang Mongondow Regency. The research method used is survey method. Subdistricts and villages as samples have been determined by purposive sampling that is the subdistricts and villages located in the coastal area of South Bolaang Mongondow Regency. Respondents as many as 100 people were determined by simple random sampling. The results showed that the average of household income obtained was Rp 3022300 per month per household.

The number of households consuming beef is as much as 100 percent, meat from local chicken 96 percent, goats 43 percent, chicken 6 percent, pig 4 percent and chicken eggs 90 percent. The average consumption of livestock products per year per household is 217.60 eggs, beef 1.15 kg, 1.34 kg chicken meat, 1.11 kg goat meat, 1.83 kg chicken meat and 2.50 kg pork. Based on the result of the research, it can be concluded that the income received by the household is low because only Rp 100,743.33 per day, the consumption of livestock product is still under the standard, for meat only about 1.37 kg / capita / tahun. Suggestions, it is necessary government intervention to improve livestock business as a source of income for coastal communities.

**Keywords:** Consumption, Meat, Eggs, Household, Coastal

### Introduction

Indonesia in this case can already be self sufficient for eggs and broiler chicken meat, but the needs of animal food from beef and milk can not be sufficient. Based on the results of Widya Karya from Food and Nutrition 2004, the nutritional norm of animal protein is recommended 15 grams / capita / day consist of 9 grams / capita / day derived from fishery commodity and 6 gram / capita / day derived from livestock commodities. Consumption of animal protein from livestock as much as 6 gram / capita / day or equivalent with 10.3 kg of meat / capita / year, 6.5 kg egg / capita / year, and 7.2 kg milk / capita / year (Directorate General of Livestock, 2006) [1]. According to Cahyani et al (2008) [2], the condition of food consumption pattern, from the society for now is the dependence of people's food consumption on food sources of carbohydrate, especially rice is still very high (more than 60%), while animal food is still very low. It further stated that the condition has implication on the low score of diversity of food consumption pattern (PPH score) (based on Susenas 2007 only reach 82.08). In addition, the score of food consumption patterns also tend to fluctuate with the development

of national economic conditions, economic crisis that occurred in the period 1997-2000 and followed by a decrease in PPH score (Cahyani et al, 2008) [2].

Food consumption from animals tends to increase due to the improving economic condition of people from a region. In addition, increased public awareness of nutrition can lead to increased consumption of food including animal food from livestock. Nutrition according to Nilsen et al (2010) [3] is one of the determinants of disease. Diet and eating habits are the keys to disease prevention. Streppel et al (2012) [4] uses the NRF (Nutrient Rich Foods) index to measure the nutritional quality of individual foods and can be used to assess nutritional density of whole food. Theoretically, increase of consumption is influenced by income received by household. The higher household income hence tendency to consume livestock product will be higher. Several research results indicate that income factor, education and number of household member influence to meat consumption. In essence, the availability of animal food from livestock is determined by level of public income and awareness of good nutrition.

The problem is that coastal communities are low income people, resulting in a tendency to consume livestock products, also low. Consumers of food sources of livestock products, allegedly more for urban communities than in rural areas. This is as stated by Muzayyanah et al (2017) [5] that households in urban areas consume more animal protein than households in rural areas. The extent to which households in rural areas especially in coastal areas are categorized as low income and even poor in consuming livestock products is not known. This research has been conducted with the aim to know amount of income and consumption of livestock products (meat and egg) in South Bolaang Mongondow Regency, North Sulawesi, Indonesia.

### Materials and Methods

The material of this research is livestock and livestock products. Livestock is type of livestock developed in South Bolaang Mongondow Regency, North Sulawesi, Indonesia. Livestock products are meat and eggs consumed by coastal community of South Bolaang Mongondow Regency, North Sulawesi, Indonesia. The research method used is survey method. Districts and villages as the location of study were determined by purposive sampling of districts and villages located on coast of South Bolaang Mongondow Regency, North Sulawesi, Indonesia. Respondents were households for three villages with 100 samples determined by simple random sampling. Data analysis used is descriptive analysis.

### Results and Discussion

Food of origin of livestock is needed for growth, health and intelligence of Indonesian society. Meat is one of food, which is very important in fulfilling the nutritional needs of community, and is an economic commodity that has strategic value. The needs of meat in Indonesia mainly come from: (a) poultry (broiler, laying male, local chicken and duck), (b) beef (beef cattle, dairy cow and buffalo), (c) pigs, and (d) goats and sheep.

The pattern of consumption of livestock products by coastal communities depends on the characteristics of household members. Characteristics of household concerned include age, education level, number of family members and household income. In theory, consumption is a function of income. Increased income lead to household consumption tends to increase. Consumption of livestock products in this study involves consumption of meat and eggs. Meat consumption consists of beef, local chicken meat, chicken meat, goat's meat and pork.

Age is related to a person's ability to allocate his workforce to earn income. Income earned by household members is allocated for consumption expenditure. Age in this study was measured from the age of father and mother. Distribution of respondent household based on father and mother age in South Bolaang Mongondow Regency, North Sulawesi, Indonesia can be seen in Table 1.

**Table 1: Distribution of Number of Fathers and Mothers by Age in South Bolaang Mongondow Regency, North Sulawesi, Indonesia**

No.	Age (Year)	Father (Persons)		Mother (Persons)	
		Amount	%	Amount	%
1.	15-24	0	0	2	2.00
2.	25-34	29	29.00	32	32.00

3.	35-44	38	38.00	42	42.00
4.	45-54	15	15.00	10	10.00
5.	55-64	11	11.00	11	11.00
6.	> 65	7	7.00	3	3.00
Total		100	100.00	100.00	

The data in Table 1: shows that both father and mother in South Bolaang Mongondow Regency, North Sulawesi, Indonesia as respondents are at productive age. Fathers aged less than 65 years about 93 percent. Mother age under 65 years about 97 percent. This means that members of the household, both father and mother in this area still have the ability to allocate its workforce for productive business. Allocation of power to productive business causes father and mother to earn higher income.

The level of education is also one of characteristics of households that affect consumption pattern of livestock products. The formal education of household community, which is increasingly higher, leads them to tend to think rationally. Households will be more rational in determining food of high nutritional value. Distribution of respondent households based on education level of father and mother in South Bolaang Mongondow Regency, North Sulawesi, Indonesia can be seen in Table 2.

**Table 2: Distribution of Number of Fathers and Mothers by Education Level in South Bolaang Mongondow Regency, North Sulawesi, Indonesia**

No.	Education Level	Fathers (Persons)		Mothers (Persons)	
		Amount	%	Amount	%
1.	Primary school	58	58.00	65	65.00
2.	Junior high school	29	29.00	27	27.00
3.	Senior high School	13	13.00	8	8.00
Total		100	100.00	100.00	

The data in Table 2 shows that formal education level of father and mother in South Bolaang Mongondow Regency, North Sulawesi, Indonesia is mostly at the elementary level (SD). The Primary School education level for the father is 58 percent. Junior High School (SMP) 29 percent and High School (SMA) as much as 13 percent. Formal education level of mothers in South Bolaang Mongondow Regency as respondents are Primary School level as much as 65 percent. Junior High School education level of 27 percent and senior high school 8 percent. Based on this data indicates that the state of education both father and mother are still categorized as low. According Muatip (2008) [6] that reason farmers do not continue the school is a limitation of costs. Socioeconomic status (SES) is low from the community indicates they have a limited economy. Sandvik et al (2010) [7] examines socioeconomic status (SES) in consumption patterns. The low level of education according to Yuliandri (2015) [8] is due to unfavorable economic needs. Low levels of education indicate that one has not thought rationally in meeting their needs. Father and mother of the household have not been able to decide quality food for consumption. The result of research from Yuliandri (2015) [8] shows that education and age of mother influence to pattern and behavior of food consumption from livestock.

The number of family members is one of the decisive factors in consuming livestock production. The number of family members indicates the state of demographic structure affecting the  $c/w$  ratio. The higher number of family members, total consumption of livestock products tends to increase. The number of household members in South Bolaang Mongondow Regency is around 2-9 members. Household characteristics such as demographic structure affect the consumption pattern of livestock products. Households with low  $c/w$  means the number of workers are greater than consumption burden. Gabriel (2008) [9] states that large families are classified into three categories, namely small family ( $\leq 4$  persons), medium family (5-7 persons), and extended family ( $\geq 8$  persons). According to Yuliandri (2015) [8], average number of families of farmers, who are members as many as 5 people are categorized as a moderate family. The number of household members can decrease pattern and behavior of food consumption of livestock in dairy farmer's household (Yuliandri, 2015) [8].

Income in this study is calculated based on income received by father, mother and child. The income of coastal community households of South Bolaang Mongondow Regency is around Rp 900,000 - Rp 12,500,000 or an average of Rp 3,022,300.00 per month. The results of this study indicate that income level is categorized low because if calculated per day then average income is only Rp 100,743.33 per household. Widaningsih (2008) [10] stated that increase in income of a household cause's income elasticity value to be positive. This means that the increase in household income makes all groups of luxury goods into normal goods or become staple goods. Income by Dilago (2011) [11], affect the consumption of chicken meat. One of the factors influencing meat consumption according to Nur et al (2012) [12], Yuliandri (2015) [8] and Elly et al (2015) [13] is income. Consumption of animal protein in Indonesia according to Bahri and Tiesnamurti (2012) [14] is very low (about 6 g / capita / day) and is expected to increase sharply if population income continues to rise, which is predicted to reach US \$ 13,000 by 2025 according to the target of MP3EI 2025.

The results showed that coastal community households in South Bolaang Mongondow Regency, North Sulawesi, Indonesia consume livestock products in addition to religious holidays as well as on day of thanksgiving or on Sundays. Livestock products consumed are pork, chicken meat, local chicken meat, goat's meat, and beef and chicken eggs. Data on livestock products and number of household respondents who consume them in South Bolaang Mongondow Regency, North Sulawesi, Indonesia can be seen in Table 3.

**Table 3: Livestock Products and Number of Consumption of Household in South Bolaang Mongondow Regency, North Sulawesi, Indonesia**

No.	Livestock Products	Number	
		Household	%
1.	Beef	100	100.00
2.	Chicken meat	6	6.00
3.	Local chicken meat	96	96.00
4.	Goat meat	43	43.00
5.	Pork meat	4	4.00
6.	Chicken egg	90	90.00

The number of households being sample of research in South

Bolaang Mongondow Regency, North Sulawesi, Indonesia is 100 respondents. The data in Table 3 shows that 100 percent of households consume beef. Most of beef is obtained from mosque during Eid al-Adha. Firmansyah and Farhan (2014) [15] states that habit of consuming beef is on certain days. Households consuming local chicken meat about 96 percent. Local chicken meat consumed is obtained from livestock owned by its self and a small part is obtained by buying. Households consuming chicken eggs are about 90 percent. Households who consume goat meat about 43 percent. Most of goat meat is obtained from mosque during Eid al-Adha, a small portion consume at time of celebration. The indication is that households in South Bolaang Mongondow Regency consume livestock products at parties, although some are consumed by buying. Rehm et al (2011) [16] has exploited distribution of food costs, and quality for strata of the United States population and examined relationship between two variables. The average data of consumption of livestock products in South Bolaang Mongondow Regency can be seen in Table 4.

**Table 4: Average Number of Consumption of Livestock Products by Household in South Bolaang Mongondow Regency, North Sulawesi, Indonesia**

No.	Livestock Product	Average of Consumption (Year)
1.	Beef (Kg)	1.15
2.	Chicken meat (Kg)	1.83
3.	Local chicken meat (Kg)	1.23
4.	Goat meat (Kg)	1.11
5.	Pork meat (Kg)	2.50
6.	Chicken egg (Egg)	217.6

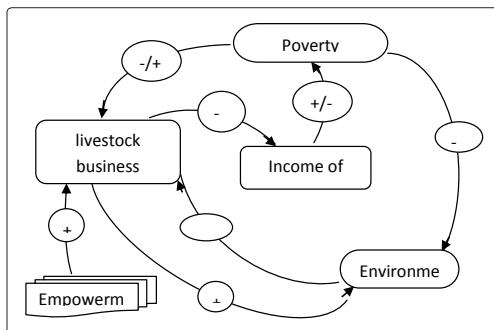
The data in Table 4 shows that all livestock products consumed by households in South Bolaang Mongondow Regency, North Sulawesi, Indonesia have not been in accordance with the target. The results of Bakrie et al (2008) [17] showed that eggs are a source of animal protein consumed more by respondents than meat and milk. The average consumption of beef, per capita per year by people of West Papua according to Widayati et al (2011) [18] is 0.45 kg, indicating consumption of beef in South Bolaang Mongondow is still lower. The results of this study differ from Muzayyanah et al (2017) [5] which states that household respondents have a tendency (marginal effect) increased consumption of food sources of animal protein from livestock products. Development of farms in this area certainly needs to be improved in accordance with the potential of the region.

Poverty is closely related to household income. Increasing household income through livestock development has an impact on poverty levels. Introduction of technology can be done in the research area with the aim to change the attitude and behavior of farmers from the traditional pattern leads to the application of technology. Differences agroecosystems of research areas and institutions of development actors (introducer) as well as formal and non formal leaders will provide different levels of difficulty in adopting new technologies. Government efforts certainly do not stop, because the main purpose is to increase consumption of food products derived from livestock, so that people's purchasing power should not be a serious obstacle. Various ways to increase food consumption come from livestock products, such as increased livestock ownership accompanied by the main promotion of increased consumption for families, which in turn can also end up for sale. According to Rusfidra and Purwati (2009) [19] that the term livestock revolution was first introduced



by Delgado et al. 1999, in the article “Animal Husbandry 2020: The Future Food Revolution”, they predicted an increase in production and consumption of animal food. Townsend et al (2009) [20] suggests that government intervention is required for low-income families to improve the quality of food due to their limited budget. The cost of high nutritious foods contributes to socioeconomic inequalities, hence the need for the formulation of nutrition and public health policies (Monsivais et al, 2010) [21]. According to Thomson et al (2011) [22] that adult dietary intervention as a substitute for healthy foods improves dietary quality and energy intake from health decline. Furthermore Maillot et al (2011) [23] compares the effects of eliminating or adding, selected nutritional recommendations, to changes in dietary requirements to meet a range of nutritional recommendations.

The package component of livestock intensification technology has potential to improve efficiency of livestock. Livestock efficiency can be achieved through introduction of livestock, feed, breeds, disease prevention and livestock management in general. Application of livestock packages in poor areas is expected to maximize livestock productivity. Maximum livestock productivity can lead to increased incomes of coastal households. Based on the above ideas, the introduction of environmentally friendly livestock technology through empowerment of poor households in coastal areas can be done as in



**Figure 1:** Introduction of Animal Technology through Empowerment of Coastal Household

One way that can be done to increase consumption of livestock products is the increase in livestock population in accordance with potential and superior of region. Rachman and Supriyati (2011) [24] suggest importance of livestock development in accordance with local potentials to increase food availability at the regional level, improve access and consumption of food by household, and in turn improve the quality of human resources.

Implementation of technology in coastal communities (such as Figure 1) is expected to assist the provision of animal food from livestock. Stimulation of livestock productivity can be improved through implementation of government policies to support the development of livestock production systems and with assembly of appropriate technological innovations. Technological innovation, in addition to the productivity of livestock, must also touch on aspects of animal health handlers, as well as the processing of livestock products that are safe and lawful. Some researchers have suggested that the increase in animal food products can be pursued in several ways, including through (i) increasing livestock populations, (ii) the importation of food ingredients of livestock products, which are then made various food products of livestock, and (iii) food importation ready for consumption of livestock products. But according to

Lastinawati (2010) [25], the dependence of food from imports, and inability of a nation to achieve food self sufficiency, will cause national resilience to be disrupted. On the other hand, consumption of animal products is determined by family income in community and people’s lifestyles as food consumers made from animal products. An increase in animal food products is related to food security. According to Garnett (2014) [26], the food security system is a global priority. Food security is another pillar of sector development. According to Thornton (2010) [27], the historical change in demand for livestock products is largely driven by the growth of human population, income growth and urbanization as well as production responses to different livestock systems, has been linked to science and technology and increased numbers of livestock. According to Soedjana (2011) [28], policy options related to improving the productivity, quality, and efficiency of livestock business due to the dynamic development of farms will provide opportunities for traditional farmers to increase their income.

### Conclusions and Suggestions

Based on the result of the research, it can be concluded that the income received by the household is low because only Rp 100,743.33 per day, the consumption of livestock product is still under the standard, for meat only about 1.37 kg/capita/year. Suggestions, it is necessary government intervention to improve livestock business as a source of income for coastal communities.

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