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Beef Cattle Farmers Perception toward Urea Mineral Molasses Block

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***Abstract*—**Urea Mineral Molasses Block is very important for beef cattle, because it can increase beef production. The purpose of this research was to know beef cattle farmers' perception towards Urea Mineral Molasses Block (UMMB). This research was conducted in Gowa Regency, South Sulawesi, Indonesia in 2016. The population of this research were all beef cattle farmers. Sample was chosen through purposive sampling. Data were collected through observation and face to face with deep interview using questionnaire. Variables of perception consisted of relative advantage, compatibility, complexity, observability and triability. There were 10 questions. The answer for each question was scored by 1, 2, 3 which refer to disagree, agree enough, strongly agree. The data were analyzed descriptively using frequency distribution. The research revealed that beef cattle farmers' perception towards UMMB was categorized as strongly agree.

***Keywords*—**Beef cattle, farmers, perception, urea mineral molasses block.

I. Introduction

BEEF cattle is one of the livestock which produce red meat. As a source of animal protein, the demand for beef meat increase steadily year by year caused by economic and population growth.

According to [1], beef cattle have many benefits such as: Beef cattle has high quality of meat and skin compare to other cattle; they are powerful to carry something or as transportation vehicle; they can be used as investment or saving; and for traditional ceremony.

Reference [2] argued that there are 4.6 million households who own 2-3 heads of beef cattle in Indonesia. 98% of them is family farming. It is difficult to achieve self-sufficiency in beef in a short time, because the calving interval was longer than the ideal, the conception rate was low, the calf mortality rate is high. Besides that, beef consumption is higher than beef production. Therefore, Indonesia imported of live cattle 700,000 head (120,000 ton meat equivalent) and 140,000 of frozen meat from other countries, such as Australia, New Zealand and America.

In order to continue to foster the development of livestock, it is necessary to introduce a variety of appropriate technologies to the public. One of the technologies in the field of animal feed is the use of UMMB as a feed supplement in ruminant livestock. References [3], [4] argued that UMMB was feed supplement as a source of protein, energy and mineral which was needed for ruminant, solid and rich of nutritious feed.

Many studies showed the benefits of UMMB. Reference [5] found that UMMB can increase body weight between 0.2 and 0.45 kg each day. Feed efficiency increased between 1.2 and 2.9. Reference [6] argued that the UMMB improves the quality and milk production. According to [7], the combination between rice straw and UMMB increased feed consumption on sheep. Furthermore, [8] argued that the combination between UMMB and fish meal increased growth rate of the calves.

Reference [9] found that the UMMB has a positive impact on farmers' incomes. The results of the experiment conducted by [10] showed that the UMMB supplementation has significantly influenced ($P<0.05$) the live weight gain, and feed conversion ratio in sheep. According to [11], supplements can increase weight gain of pregnant does.

Reference [12] argued that UMMB is not so complicated to make, is not dangerous for the cattle and the raw material can be found in the farms. Besides that, [13] argued that supplementation of UMMB increased feed consumption, milk production and body weight of the cows in India during dry season. According to [14], adoption of UMMB was found to be positively and highly significantly correlated with all the communication variables which consisted of mass media exposure, personal cosmopolite, personal localite, communication sources and communication skill.

Farmers agree with the use of fermented rice straw as animal feed, because it was cheap and easy to make [15]. Although UMMB fits to the shortage of feed situation, it cannot be prepared locally due to unavailability of molasses in the area. Besides that, high transportation costs and feed blocks from plains areas are a big problem for farmers [16].

Reference [17] stated that factors influencing the adoption of UMMB technology were:

1. Livestock feeding patterns of smallholders including the use of UMMBs are determined by the existing farming systems and livestock management practices.
2. Adoption of UMMBs by milk producers is influenced by the perceived direct benefits of UMMB.
3. The major emphasis of development and diffusion of UMMB has been to try to fit the innovative product within the existing system.

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4. The case study is based on limited field research, however, the findings and the trends discussed need to be examined further through in-depth and rigorous research, for a clearer understanding of adoption processes and in order to develop an appropriate approach.

Constraints influencing the adoption of UMMB technology:

- The prices of ingredients used in UMMB go on fluctuating according to the season. For example, the price of molasses, maize etc. in the local market is unstable, reflecting its seasonal availability. Its availability is higher and price lower in the sugar cane crushing season.
- Farmers are interested to purchase the UMMB licks from the local market, but there is no large-scale manufacturer in the market.
- Level of education of the farmers is an important factor. The technology was adopted more rapidly in those places having a higher proportion of literate people.
- The economic condition of farmers affects technology adoption. Poor farmers are unable to purchase UMMBs due to lack of money, as they purchase their food daily and often meet requirements by selling milk on a daily basis.
- Large-scale production of UMMB, which could increase availability, is probably not possible without financial support from the Government, due to lack of capital investment.
- Usually, medium-scale milk producers (5–15 kg milk/day) at village level are more concerned about increasing milk production and are ready to invest in the technology.
- Farmers having only one or two cows with low production levels are less interested in additional investment.

Gowa regency was famous as the second most populous beef cattle in South Sulawesi province after Bone regency. Total population of beef cattle in 2015 was 111,345 head [18]. Most of beef cattle farmers have a problem in providing animal feed in dry season; therefore, their beef cattle production was low. UMMB was one of technology to improve beef production and quality.

The objective of this research was to know beef cattle farmers perception toward UMMB.

II. Research Method

A. Research Design

The research was conducted in 2016. The population of this research consisted of all of beef cattle farmers in Gowa Regency, South Sulawesi, Indonesia. Thirty samples were chosen through purposive sampling. The data were collected through observation and face-to-face with deep interview using questionnaires. The data were analyzed descriptively by using frequency distribution.

B. UMMB

To produce 10 kg of Urea Mineral Molasses Block (UMMB), the formula according to [19] was as in Table I.

TABLE I
Composition of UMMB

Raw material	kg
Molasses	3.3
Dry cassava	0.8
Bran	1.8
Soy flour	1.3
Fish powder	0.6
Mineral mix	0.9
Lactate mineral	0.125
Salt	0.75
Urea	0.425

The method was:

a. Mix material which is solid or dry, starting with the least amount, and then added to a larger material, stirring until blended.
b. Add the liquid ingredients and stirred so that no lumps.
c. Print and pack the dough of UMMB with clear plastic.

UMMB can be used for 3-6 months. UMMB can be given in the morning. The requirement of UMMB for beef cattle and buffalo were 350 g/head/day, while goat and sheep need UMMB 120 g/head/day.

C. Characteristics of Innovation

Reference [20] argued that there were five characteristics of innovation, namely: The relative merits (relative advantage), compatibility (compatibility), complexity (complexity), the ability to be tested (trialability), and the ability to be observed (observability).

1. Relative Advantages

The perception of the relative advantage of an innovation will be interpreted differently by each person. An innovation will be adopted more quickly if a greater relative benefit.

2. Suitability (Compatibility)

Innovation conformity with social and cultural values of an area and norms will affect the process of adoption of an innovation. For example, if an innovation or new ideas are not in accordance with the values and norms, so that innovation cannot be adopted easily as with innovations that match (compatible).

3. Complexity

Complexity is the degree to which an innovation is considered relatively difficult to understand and use", in contrast to other attributes, complexity is negatively correlated with the rate of adoption.

4. Trialability

The ability to be tested is where an innovation can be tested right in a real setting, thus it will be quickly adopted.

5. Observability

The ability to observe is the degree to which the results of an innovation can be seen by others. The easier a person to see the results of an innovation, the more likely the person or

group of people are adopting. Observability is also positively correlated with the rate of adoption of an innovation.

In summary, [20] argued that innovation relative offered more benefits, compatibility, simplicity, trialability, and observability will be adopted more quickly than other innovations. So we can conclude that the greater the relative advantage; conformity (compatibility); the ability to be tested and the ability to observe and the less complexity, the faster the possibility that these innovations can be adopted.

D. Indicator Measurement

To know the perception of beef cattle farmers toward UMMB, there were five variables will be asked namely: complexity, trialability, observability, productivity and profitability. Likert scale can be used to measure attitude and perception [21]. Every answer was scored 1 for disagree, 2 refer to agree and 3 refer to strongly agree. There were 10 questions. The data were analyzed descriptively using frequency distribution.

To measure relative advantage, complexity, compatibility, trialability and observability variables, the formula is as:

$$Maximal\ value = maximum\ score\ x\ number\ of\ sample \quad (1)$$
$$Maximum\ value = 3\ x\ 30 = 9$$

$$Minimal\ value = minimum\ score\ x\ number\ of\ sample \quad (2)$$
$$Minimum\ value = 1\ x\ 30 = 30$$

$$Class\ distance = Class\ distance = \frac{90-30}{3} = 20$$

Therefore, the perception of beef cattle farmers toward UMMB can be categorized as:
Strongly agree = 70 - 90
Agree = 50 - 69
Disagree = 30 - 49

The Total value of total perception was

$$Maximum\ value = maximum\ score\ x\ number\ of\ sample\ x\ number\ of\ sub\ variable \quad (4)$$
$$Maximum\ value = 3\ x\ 30\ x\ 5 = 450$$

$$Minimal\ value = minimum\ score\ x\ number\ of\ sample\ x\ number\ of\ sub\ variable \quad (5)$$
$$Minimum\ value = 1\ x\ 30\ x\ 5 = 150$$

$$Class\ distance = \frac{maximum\ value - minimum\ value}{score\ number} \quad (6)$$
$$Class\ distance = \frac{450-150}{3} = 100$$

This can be categorized as:
Strongly agree = 350 - 450
Agree = 250 - 349
Disagree = 150 - 249

III. Results and Discussion

A. Characteristics of Respondents

Most of beef cattle farmers 97.67% were men. Only 3.33% was woman. This means that men dominated women in beef cattle farms. There were many things to do in beef cattle farming, such as looking after the animal, providing feed and drinking water. Additionally, they do domestic jobs which very time consuming, such as caring the children, cleaning the house, washing and cooking.

TABLE II
The Characteristics of Respondents

Characteristic of respondents	Percentage (%)
Gender	
Men	97.67
Women	3.33
Age	
Productive period (15-64 years old)	93.33
Unproductive period (>64 years old)	6.67
Education	
Elementary school	36.67
Junior high school	6.67
Senior high school	34.33
Bachelor	13.33
Farm experience	
< 5 year	30.00
5 – 10 year	43.33
> 10 year	26.67
Number of cattle	
< 5 head	66.67
5 – 10 head	30.00
> 10 head	3.33

On average, majority of beef cattle farmers were in productive age. Number of beef cattle farmers who were in productive age was 93.33%. They were still strong enough to manage their cattle. Only 6.67% were in unproductive age. According to their education, majority of respondents were from senior high school (43.33%). This means that their education was high enough and they are open to innovation. Based on their experience on their farm, majority of respondents have experience 5-10 years (43.33%). In other words, they have experience to manage their cattle. Most of them got the lesson from their parents. Looking at the number of their beef cattle, majority of respondents had less than 5 heads, 66.67%. The highest beef cattle ownership was 11 heads. Regarding their livelihood, 76.67% of beef cattle farmers also worked as farmers.

B. Perception of Beef Cattle Farmers

Perception of beef cattle farmers toward UMMB can be seen in Table III.

The weight of Relative Advantage was 84. This means that beef cattle farmers strongly agree that UMMB gave much benefit to farmers, such as increased body weight of their cattle and feed intake if they adopt this technology. The weight for Compatibility was 78, this means that beef cattle farmers strongly agree that UMMB technology was supported by socio-culture of beef cattle farmers. Trialability weight was 80. This means that the beef cattle farmers strongly agree that UMMB technology could be tried for all ruminants livestock. The weight of Observability was 77. This means that the beef

cattle farmers strongly agree that the UMMB technology could be observed the effect to the development of livestock. On the other hand, Complexity was the lowest weight: 55. According to perception of respondents, UMMB technology was complicated (75.5%), in other words it was difficult to make. This research did not agree with that of [12] who said that manufacture was easy and simple.

TABLE III
PERCEPTION OF BEEF CATTLE FARMERS TOWARDS UMMB

Characteristics of innovation	Weight	Category	(%)
Relative advantage	0	Disagree	0.00
	12	Agree	14.29
	72	Strongly agree	85.71
	84	Strongly agree	100
Compatibility	0	Disagree	0
	24	Agree	30.77
	54	Strongly agree	69.23
	78	Strongly agree	100
Complexity	13	Disagree	23.64
	18	Agree	32.73
	24	Strongly agree	43.64
	55	Agree	100
Trialability	0	Disagree	0
	20	Agree	25.00
	60	Strongly agree	75.00
	80	Strongly agree	
Observability	0	Disagree	0
	26	Agree	33.77
	51	Strongly agree	66.23
	77	Strongly agree	100
Total (1 + 2 + 3 + 4 + 5)	374	Strongly agree	

Overall, total weight was 374. In general, the respondents strongly agree with UMMB. This research agree with that of [15] who argued that technically, economically, and culture-socially the characteristics of fermentation technology is acceptable.

IV. CONCLUSION

Based on this research, it can be concluded that perception of beef cattle farmers toward UMMB was categorized as strongly agree. The development of Urea Molasses-Block should be encouraged in order to increase beef cattle production.

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