The Perception of Beef Cattle's Farmers on Implementation of Artificial Insemination in Three Central Areas of Beef Cattle in Indonesia

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Abstract

The general objective of the research is to describe and analyze implementation of adopted artificial insemination (AI) innovation on slaughter cattle's farmers. Specifically, is to describe and analyze the perception of slaughter cattle's farmers on AI. The locations of the research are Geger District of Bangkalan Regency and Mantup District of Lamongan Regency in East Java Province and Penebel District of Tabanan Regency in Bali Province. This research was designed as a correlation descriptive survey by both quantitative and qualitative approach. The number of sample is 240 respondents -who are the acceptors of AI- and by approach of purposive sampling method. Data collection was completed with questionnaires, interview and field observation. Kruskal-Wallis Test and U Mann-Whitney Test were applied to analyze the data sample. The result of the research showed that the perception of the farmers on most of AI's aspects are significantly different among locations of the research, with the exception of the phenotype (physical appearance) of breed cattle and the artificial insemination services by inseminators. To be suggested that socialization or extension on AI should be conducted by different approaches to fit the characteristic of internal and external and AI's perception of the farmers.

Keywords: perception, artificial insemination

Introduction

Artificial insemination (AI) had been introduced to Indonesia since year 1950s. The technology have been tested and applied widely in year 1969, however, the policy of implementation just have first been enforced by Indonesian government on year 1976. At that time, the implementation of AI was meant to improve dairy and beef cattle's production and productivity.

Artificial insemination as a reproduction technology was an instrument to achieve breeding goal. According to Gordon (2004), the AI were a proven technology

and became the most applicable and important reproduction technology since twentieth decade. It was so because the AI technology was relatively affordable and applicable. According to Skjervold (1982), during the last two decade, the AI technology had become the most important breeding technique and this technique has given a new dimension to cattle breeding activity. In general, the AI was aimed at: 1) to improve genetic quality of offspring; 2) to faster the distribution of high breed gene among its offspring; and 3) to improve efficiency of high performance bull utilization (Foote 1981; Gordon 2004).

The AI technology have replaced natural mating method which were applied by the farmers for centuries. Natural mating method have became a major part of social and culture of Indonesian farmer. Therefore, the farmer responses to the AI technology transformation process were not as simply. It was influenced by several factors and the process took times. According Lionberger and Gwin (1982:5), factors that influenced farmer response to an introduction of innovation were (1) individual, (2) situation and (3) characteristic of the innovation factors. Furthermore, the response to each innovation was different between person to person and between communities to community, so to its measures was also different. So far, according to van den Ban and Hawkins (1999:140), in most diffusion innovation research, only a few concerns have been given to a massive changing in social structure or community's way of life. Institutional and community changing were also rarely been investigated. In fact, such social changing were very important, especially to vilage community. According to Rogers (2003:11), innovation was an idea, conduct, or object which were considered new to an individu or a group. Innovation characteristic, as they meant, will explain the different speed of the innovation adoption processed. The innovation characteristics were 1) relative advantages, 2) compatibility, 3) complexity, 4) trialability and 5) observability (Nasution 2002:125). After almost 4 decades of the AI introduction, phenomena of community respons to the technology were still vary. The farmer were grouped into AI- :1) minded; 2) accepted; 3) tried, and 4) rejected.

Research problem which was become focus of observations were how the beef cattle farmer perception on AI. In general, objectives of this research were to get the information rate of adoption on AI innovation, particularly to know: 1) internal and external characteristics of beef cattle farmer and 2) beef cattle farmer perception on AI.

Materials and Methods

The research were desaigned as a correlational descriptive survey research using quantitative and qualitative approaches. The research were conducted in three regencies. Lamongan and Bangkalan regencies represented area of local cattle breeds namely Ongole cross (PO) and Madura, respectively. While, Tabanan regency

represented area of Indonesian indigenous cattle breed namely Bali Cattle. Research population were taken from all beef cattle farmers of AI acceptors from Mantub District of Lamongan Regency, Geger District of Bangkalan Regency and Penebel District of Tabanan Regency. The total amount of 240 farmer samples were taken from the three locations (80 samples from each location). Primary data were collected through respondens interview based on quisionaire that have been prepared and tested earlier as well as from other sources. Statistical data analyses were conducted using 1) descriptive statistic and 2) *Kruskal-Wallis Test* and *U Mann-Whitney Test* to test the different means of samples (Santoso 2004).

Results and Discussions

Internal characteristics of beef cattle farmer

Internal characteristics of beef cattle farmer parameters included several indicators as shown in Table 1. Result of *Kruskal-Wallis Test* of the samples showed that in general, internal characteristics of beef cattle farmer were significantly different between different locations, except for the motivation to use the AI.

External characteristics of beef cattle farmer

External characteristics of beef cattle farmer parameters included indicator as shown in Table 2. *Kruskal-Wallis Test* result showed that in general, indicator of external characteristics of beef cattle farmer were significantly different between the locations, except for the information availability.

Beef cattle farmer perception on the AI

Perception of beef cattle farmer on the AI was the means were given to accept or rejected the AI based on process of self observation or experience by individual farmer. The farmer perception on AI innovation included technical (type of cattle breed, physical characteristics, goal of breeding/AI, goal of breeding/AI, inseminator services, oestrus symptoms), socio-cultural (social norm system, cattle farmer institution, social structure), economic (production improvement by AI, relative profit) and government regulation (cross, pure-breed, cross and pure-breed/mix) aspects of beef cattle breeding.

Evaluation results on the reliability perceptions which constructed all the indicators showed a coeffiecient of VE = 0.21. Based on their degree of probability, several perception indicators were more dominant to form perception parameters. They were type of cattle breed (39%; $R^2=0,20$), inseminator services (13%; $R^2=0.20$), oestrus symptoms (11%; $R^2=0.32$), social structure (20%; $R^2=0.32$), production improvement by the AI (7%; $R^2=0.61$), relative profit (19%; $R^2=0.54$) and pure-breed program regulation (28%; $R^2=0.28$).

Table 1. Indicator distribution of internal characteristic of beef cattle farmer

Internal characteristics	Bangkalan		Lamongan		Tabanan		Total	
	total (person)	%	total (person)	%	total (person)	%	total (person)	%
Farmer age (years)								
· young (25-33)	1	1.3	8	10.0	5	6.3	14	5.8
· adult (34-51)	51	63.7	57	71.3	41	51.3	149	62.1
· older (52-68)	28	35.0	15	18.7	34	42.4	77	32.1
Farmer education								
· low (<finish elementary school)	79	98.7	53	66.2	45	56.2	177	73.8
· middle (finish high school)	1	1.3	25	31.3	33	41.3	59	24.6
· high (finish college)	0	0.0	2	2.5	2	2.5	4	1.6
Farmer experience of beef cattle keeping (years)								
· less experienced (1-11)	9	11.3	21	26.3	10	12.5	40	16.7
· experienced (12-33)	71	88.7	38	47.5	40	50.0	149	62.1
· highly experienced (34-55)	0	0.0	21	26.2	30	37.5	51	21.2
Number of cattle owned (AU)								
· few (0.5-1.9)	49	61.3	29	36.2	51	63.7	129	53.8
· enough (>1.9- 4.9)	31	38.7	50	62.5	29	36.3	110	45.8
· many (>4.9-7.5)	0	0.0	1	1.3	0	0.0	1	0.4
Farmer orientation (income)								
· part time (<30%)	68	85.1	46	57.5	37	46.2	151	62.9
· branch of business (30-70%)	9	11.2	12	15.0	31	38.8	52	21.7
· main business (>70%)	3	3.7	22	27.5	12	15.0	37	15.4
AI motivation used								
· external factor (extrincsic)	47	58.7	42	52.5	56	70.0	145	60.4
· self motivation (intrincsic)	33	41.3	38	47.5	24	30.0	95	39.6
Membership of AI group								
· non member	68	85.0	78	97.4	80	100	226	94.2
· member/committee	12	15.0	2	2.6	0	0.0	14	5.8
Degree of cosmopolitan (freq/month)								
· low (0-2)	43	53.0	34	42.4	76	95.0	153	63.6
· mild (3-8)	37	47.0	32	40.1	4	5.0	73	30.6
· high (9-12)	0	0.0	14	17.5	0	0.0	14	5.8
Income from selling cattle (mio. rupiah/year)								
· low (<8.6)	78	97.5	55	68.7	65	81.3	198	82.5
· middle (8.6-25.7)	2	2.5	21	26.2	15	18.7	38	15.8
· high (>25.7-42.9)	0	0.0	4	5.1	0	0.0	4	1.7

Table 2. Indicator distribution of external characteristics of beef cattle farmer

External characteristics	Bangkalan		Lamongan		Tabanan		Total	
	total (person)	(%)	total (person)	(%)	total (person)	(%)	total (person)	(%)
AI institution								
· low (1 institution)	75	93.7	64	80.0	67	83.7	206	85.8
· middle (2 institutions)	5	6.3	10	12.5	13	16.3	28	11.7
· high (>2 institutions)	0	0.0	6	7.5	0	0.0	6	2.5
AI equipments								
· not available	22	27.5	76	95.0	41	51.3	139	57.9
· less available (only 1 set)	52	65.0	3	3.7	15	18.7	70	29.2
· highly available (more than 2 sets)	6	7.5	1	1.3	24	30.0	31	12.9
Cattle market assurance								
· low (only 1 choice)	37	46.3	79	98.7	58	72.5	174	72.5
· middle (2 choices)	43	53.7	1	1.3	22	27.5	66	27.5
Extention services intensity (freq/6 months								
· rarely (<2 times)	48	60.0	79	98.7	51	63.7	178	74.2
· frequent (3-5 times)	32	40.0	0	0.0	6	7.5	38	15.8
· intensive (≥6 times)	0	0.0	1	1.3	23	28.8	24	10.0
AI information availability								
· difficult (only 1)	14	17.5	11	13.7	2	2.5	27	11.2
· easy (2)	43	53.7	56	70.0	62	77.5	161	67.1
· very easy (> 2)	23	28.8	13	16.3	16	20.0	52	21.7
AI information sources (type)								
· low (only 1)	29	36.2	26	32.5	15	18.8	70	29.2
· middle (2 types)	48	60.0	42	52.5	48	60.0	138	57.5
· high (> 2 types)	3	3.8	12	15.0	17	21.2	32	13.3

Based on *Kruskal-Wallis* test, the results showed that there was significant different of farmer perception among location except for the indicators of physical characteristic of cattle replacement stock and inseminator services. To know which location were different from others, *Mann Whitney U test* have been conducted. The test were run between Bangkalan and Lamongan regency, Bangkalan and Tabanan regency as well as Lamongan and Tabanan regency. The result showed that the perception of the farmer among location were significantly different about the AI.

On physical characteristic of cattle breed, the result showed that 71.2% of respondents at least agreed that the cattle breed should have great body score with great physical performance and 84.6% respondens agreed that the cattle should have ideal or proporsional body condition. High perception were shown by respondens

agreement on statement that physically, stock cattle should have great condition with heavy body weight (90.8%). The physical characteristics which can easily be seen and ideal condition of cattle body part might be the caused of why respondens perception on physical characteristics of the cattle did not show significant different among research locations.

In giving insemination services, 97.5% of respondens stated that inseminator always ready to give services anytime. To the AI charge or cost should be paid by the farmer, about 93.3% of the respondens said that the charges were equivalent to the benefit they received. Insignificant differents among research locations in the inseminator service qualities explained that insemination services were part of the AI system that operated nationally. Regulation of the AI application nationally were equipped with minimum technical standard of services that should be provided by an inseminator in giving the AI services.

The farmer perceptions on the AI between: 1) Bangkalan and Lamongan Regencies were statistically different, except for inseminator services and regulation of cross breed indicators; 2) Bangkalan and Tabanan Regencies in general also showed statistically different, except for the inseminator services, oestrus symptom and social norm system indicators; 3) Lamongan and Tabanan Regencies in general also showed significantly different, except on physical characteristic of stock, breeding goal, inseminator services, social structure and regulation of pure and cross breed, which were not significantly different between the two location.

Conclusions

In general, internal and external characteristic of beef cattle farmer were differ, except for their motivation to use the AI and the availability of AI information.

The significant indicators to contruct beef cattle farmer perception on the AI were type of stock, physical characteristic of the stock, inseminator services, oestrus symptom of cows, social norm system, social structure, improvement of production, relative income, regulation toward cross and pure breed program. The dominan factors as perception construction to the AI were improvement of production, relative income/profit, oestrus symptom, social structure, regulation toward pure breed, type of stock breed and inseminator services, respectively.

In general, the farmer perception about the AI showed different respons between locations of the research, except for indicator of physical characteristic of stock breed and indicator of inseminator services.

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