ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 10, Issue, 11, pp.75393-75395, November, 2018
DOI: https://doi.org/10.24941/ijcr.33261.11.2018

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

RESEARCH ARTICLE

THE ROLE OF FEED TECHNOLOGY IN INCREASING CATTLE PRODUCTIVITY INSOUTH MINAHASA REGENCY, NORTH SULAWESI, INDONESIA

Tilly F.D. Lumy, Meiske L. Rundengan, Anneke K. Rintjap and *Richard E.M.F. Osak

Faculty of Animal Science, University of Sam Ratulangi, Manado – Indonesia

ARTICLE INFO

Article History:
Received 09th August, 2018
Received in revised form
20th September, 2018
Accepted 19th October, 2018
Published online 30th November, 2018

Key Words:
Feed technology utilization,
Household income,
Traditional Cattle Farming.

ABSTRACT

The use of feed technology greatly influences the decision of households in carrying out production activities, allocation of labor and consumption, so it is necessary to conduct research on the relationship between the use of technology and household decisions in carrying out their activities. By studying the impact of technology on household decisions, it can be calculated how much household income is due to the use of technology in the study area. This study aimed to analyze the role of technology utilization in increasing the income of traditional cattle farmers in South Sulawesi Regency. The study was conducted by survey research that illustrate the systematic and factual about the actual phenomenon. The results showed that: (1) The use of food technology led to an increase in production costs, but also leads to increased acceptance, resulting in an increase in household income of traditional cattle farm; and (2) Some policies can improve the production yield and can reduce the cost factor that can improve the economic of the traditional cattle farmer households. Some suggestions for policy makers based on the results of this study, which is expected to implement policies: (i) support the use of feed technology application on cattle farming; and (ii) the subsidy increase in the number of cattle ownership.

Citation: Tilly F.D. Lumy, Meiske L. Rundengan, Anneke K. Rintjap and Richard E.M.F. Osak. 2018. "The role of feed technology in increasing cattle productivity insouth minahasa regency, North Sulawesi, Indonesia", *International Journal of Current Research*, 10, (11), 75393-75395.

INTRODUCTION

One of the current livestock development programs in Indonesia is a program to increase domestic beef production and provide safe, healthy, whole and halal animal food. Livestock development policies need to be based on local resource potential. The government programs and policies need to be implemented to increase the production and productivity of beef cattle breeding businesses with all the pro-people technical guidelines and implementation. The main actors in achieving the target of animal husbandry and animal health development are farmer households. In the household economy, households act as producers and as consumers. The household allocates its workforce to produce production in an effort to increase income, then the income obtained is allocated for consumption both food consumption and non-food consumption (Chayanov, 1966 and Bernstein, 2009). The household economic model is carried out to maximize usefulness (maximize the utility) of resources with four constraints, namely a) production level, b) acceptable minimum income level (Ellis, 1989 and Harison, 1975); c) maximum number of farmer's household workdays (Chayanov, 1966 dan Chavas, Petrie and Roth 2005); and family income is influenced by the amount of man-days labor in the process of production (Osak, *et al*., 2015). The use of feed technology greatly influences the decision of households in carrying out production activities, allocation of labor and consumption, so it is necessary to conduct research on the relationship between the use of technology and household decisions in carrying out their activities. By studying the impact of technology on household decisions, it can be calculated how much household income is due to the use of technology in the study area. Feed given to beef cattle in South Minahasa Regency is in the form of grass, agricultural waste, and in the last few years concentrate has been processed by using local ingredients, and has been given additional feed. The technology of feed used is classified as effective technology that is simple, in addition to being able to play a role in increasing the productivity of cattle, but it causes increased business production costs and affects the household economy of farmers. Based on the background and problems, the problem is formulated, namely: How is the role of using feed technology in improving production results and increasing the business income of traditional beef cattle.

Corresponding author: **Richard E.M.F. Osak**
Faculty of Animal Science, University of Sam Ratulangi, Manado – Indonesia

MATERIALS AND METHODS

This research was conducted in South Minahasa District. The research was conducted by survey method. The purposive

sampling was selected as many as 65 household sample farmers as respondents. Cattle production is thought to be influenced by the outpouring of labor in beef cattle, farm laborers and the amount of expenditure for animal feed, which is formulated as follows:

PoC = f(*AoL, EfF*)
PoC = a0 + a1 *AoL* + *a2 EfF* + ei
Hypothesis : a0, a1, a2, > 0

Note: PoC= Production of Cattle (IDR/year)
AoL= Allocation of Labor (hours/year)
EfF= Expenses for Feed (IDR/year)
a0= Constant coefficient
a1 and a2 = The parameter coefficients of each independent variable.

RESULTS AND DISCUSSION

Adoption of technology is an important effort to increase productivity in various production systems, namely producers benefit from the application of technology either through opportunities to reduce production costs, increase output from the same input, or by keeping the same output from input reduced. Cattle farming in the study area is generally still appropriate technology, so the adopted technology is simple. The technology analyzed in this study is feed technology that has been used by farmers, as processing of concentrates, hay, silage and ammonia of agricultural waste. The results of this study compare respondents' calculations about costs, revenues and cattle business income can be seen in Table 1.

business revenue so that it can earn a greater profit or income than without using feed technology. Utilization of feed technology by the respondent breeders aims to increase cattle farming productivity, namely cattle weight gain and increase in income, so that farmers prefer to use feed technology even though production costs increase but produce greater additional income. The results of the estimation analysis of the parameters of Production of Cattle (*PoC*) in relation to Allocation of Labour (*AoL*) in Cattle Farming and Expenses for Feed (*EfF*) can be seen as follows:

$$PoC = 69.208 + 0{,}3696AoL + a_2\,EfF + e_i$$

Probability analysis results F <0.05 means that simultaneously variables consisting of Allocation of Labour (*AoL*) in Cattle Farming and Expenses for Feed (*EfF*) have a significant effect on Production of Cattle (*PoC*). Partial test results using the t test show several things as follows:

The Effect of Allocation of Labour (*AoL*) on Production of Cattle (*PoC*), obtained t-count value of 6.30> t-table of 1.99, and Prob t of <0.0001 (p <0, 05). The results of this analysis show that partially allocation of labour (*AoL*) affect the production of cattle (*PoC*).The positive AoL parameter coefficient indicates that if the allocation of labour is increased, it will result in an increase in the production of beef cattle (*PoC*). These results are as reported by Hartono (2011) and Wantasen *et al* (2012) that the more cattles are maintained, the more efficient outflow of labor.

Tabel 1. Labour Allocation and Cattle Farming Revenues

Description		Before Feed Technology	After Feed Technology
1.	Total Labour Allocation (hours/year)	107.591	215.182
	Average Labour Allocation (hours/year/respondent)	1.655	3.310
2.	Total Revenue (IDR/year)	323.444.552,9	392.500.004,9
	Average Revenue (IDR/year/respondent)	4.976.070,0	6.038.462 ,0

Table 2. Costs, Revenues, and Profit of Cattle Farming without Feed Technology or Using Feed Technology

Description		Before Feed Technology	After Feed Technology
1	Total Cost(IDR/year)	1.369.292.947,1	1.778.812.495,1
	Average Cost (IDR/year/Respondent)	21.066.045,0	27.366.346,0
2	Total Revenue(IDR/year)	1.692.737.500,0	2.171.312.500,0
	Average Revenue(IDR/year/Respondent)	26.042.115,0	33.404.808,0
2 – 1	Total Profit(IDR/year)	323.444.552,9	392.500.004,9
	Average Profit(IDR/year/Respondent)	4.976.070,0	6.038.462 ,0

The analysis results as shown in Table 1 indicate that with the adoption of technology causes an increase in the average labor supply of 1,655 hours/year before using feed technology to 3,310 hours/year after using feed technology, thereby increasing wage costs. Increased labor expenditure is done to increase productivity, namely an increase in average income from IDR4,976,070 before using feed technology to IDR6,038,462 after using feed technology. The results of the analysis as shown in Table 2 show that with the adoption of technology an average production cost increased from IDR21.066.045 before using feed technology to IDR27.366.346 after using feed technology, but also an increase in the average profit from IDR26, 042,115 before using feed technology to IDR33.404.808 after using feed technology, resulting in an increase in profit from IDR4,976,070 before using feed technology to IDR 6,038,462 after using feed technology. This means that even though the use of feed technology causes more expensive production costs, it is accompanied by a significant increase in cattle farm

Effect of Expenses for Feed (*EfF*) on the value of Beef Cattle Production (*PoC*), obtained t-count of 2.96> table of 1.99, and Prob t of 0.0043 (p <0.05). This result shows that partially expenses for feed (*EfF*) affects the value of Beef Cattle Production (*PoC*). The parameter coefficient of Expenses for Feed (*EfF*) has a positive sign indicating that if the expenses for feed is raised, it will lead to an increase in cattle production or an additional value of beef cattle. The results of this study indicate the role of feed in production, because the feed given has been done by technology to improve quality. This means that the increase in livestock production will increase if an increase in the quantity and quality of feed. This result is in accordance with Hartono's (2011) research that theoretically the increase in production lies in the improvement in the quantity and quality of feed used. The results of the analysis of this equation show that the average number of labor outflows is 107.590,75 hours/year or with an average of 1.655,24 hours/year/respondent for a year or 4,5 hours/day for each respondent. This means that the average amount of labor

expenditure per unit of livestock is 607 hours per animal unit (AU) of cattle each year or 1,66 hours per AU/day. The amount of labor allocation is higher than that of dairy cattle from Ihsan, *et al* (2001) of 138,17 hours per AU/year or Hartono (2010) of 68,69 hours per AU/year. Allocation of farmer workforce after using feed technology is actually higher than before they use feed technology, which seems different from Chayanov's theory, that using technology will reduce the allocation of family work hours on his farm, so as to provide leisure or leisure time for family members to recreation or other activities. This difference is due to the different characteristics of technology and employment opportunities in the Chayanov area in this research area, where technology in the study area only uses traditional technology or traditional technology with a high allocation of labour time for family human labour.

Conclusion

- Allocation of Labour (*AoL*) in Cattle Farming and Expenses for Feed (*EfF*) have a significant effect on Production of Cattle (*PoC*).
- The average number of labor outflows is 107.590,75 hours/year or with an average of 1.655,24 hours/year/respondent for a year or 4,5hours/day for each respondent. This means that the average amount of labor expenditure per unit of livestock is 607 hours per animal unit (AU) of cattle each year or 1,66 hours per AU/day.
- Allocation of farmer workforce respondents after using feed technology is actually higher than before they use feed technology. The technology in the study area only uses traditional technology or appropriate technology with a high allocation of labour time for household human labour.

Acknowledgements: We thank the LPPM of University of Sam Ratulangi for the PDUU Research Grant in 2018 which has funded the research that produced this paper.

REFERENCES

Bernstein H. 2009. V.I. Lenin and A.V. Chayanov: looking back, looking forward. *The Journal of Peasant Studies* 36(1):55–81.

Chavas JP, Petrie R, Roth M. 2005. Farm Household Production Efficiency: Evidence From the Gambia. *American Journal of Agricultural Economics*. 87(1):160-179.

Chayanov AV. 1966. The Theory of Peasant Economy.eds. D. Thorner, B. Kerblay and R.E.F. Smith. Richard Irwin for the *American Economic Association. Homewood,* IL.

Ellis F. 1989. Peasant Economics, Farm Household and Agrarian Development. Cambridge University Press, New York.

Harison M. 1975. Chayanov and the Economics of the Russian Peasantry. *Journal of Peasant Studies* 2(4):389-417.

Hartono, B. 2011.Household Economic Analysis of Beef Cattle Farmers in Damsol District, Donggala Regency, Central Sulawesi Province. J. Ternak Tropika 12(1):60-70.

Ihsan, MN, Fanani Z, Wahyuningsih S. 2001. Female Labor Absorption in Dairy Cattle Business in Malang Regency. Journal of Social Sciences Research 13(1):14-19.

Kusnadi U. 2008.Animal Husbandry Technology Innovation in Plant-Animal Integration System to Support Beef Self-Sufficiency. *Agricultural Innovation Development* 1(3):189-205.

Osak, R.E.M.F., Hartono, B., and Fanani, Z., 2015. Biogas and bioslurry utilization on dairy-horticulture integrated farming system in Tutur Nongkojajar, District of Pasuruan, East Java, Indonesia. Livestock Research for Rural Development 27(4) Retrieved July 17, 2018, from http://www.lrrd.org/lrrd27/4/osak27065.htm

Wantasen E, Hartono B, Nuhfil H, Panelewen VVJ. 2012. Household Economic Behavior of Traditional Cattle Farmers in Utilizing Artificial Insemination Technology: A Case Study in Village of Kanonang III, Minahasa Regency of Indonesia. *J. Agric. Food. Tech.,* 2(8):141-152.

****