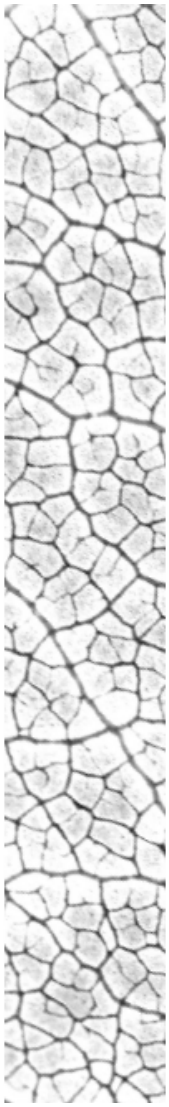

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Livestock ecology research on institution and traditional sharing systems in cattle farms

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Abstract
The present research aimed to analysis differences between the traditional profit share system and institution profit share system in cattle farms. The research was conducted from February to March 2018 in the Maiwa Sub-district, Enrekang District by using quantitative and descriptive methods. The types of data were qualitative and quantitative from both primary and secondary sources, and the data analysis used was the frequency distribution and income analysis. The results show that characteristics of the respondents in the traditional system and the institution system are similar regarding age and livestock experience, but show differences in educational attainment, a number of family members, and the commercial scale. Beef cattle farmers who follow the system of partnerships with the institution profit share system are mainly at secondary level (45.4%), while beef cattle farmers who follow a traditional profit share system are also mainly at the secondary level (46.8%). Farmers who followed the institution system had higher incomes compared to those in the traditional system of revenue sharing of pastoralists. The traditional sharing system does not involve a contract while the institution sharing system uses a contract. The institution sharing system, therefore, provided more significant benefit to farmers.

Keywords: age, beef cattle, farmer revenue, livestock experience, livestock ecology, profit

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INTRODUCTION

Beef cattle business development with a partnership-oriented agribusiness is one option for improving the income of farmers. The partnership between the owners of capital and the breeders of cattle (farmers) is implemented in such a way and with a model or form that has been agreed by both parties. The partnership is an agreement between farmers and processors and the marketing firm to produce and meet the demand with the agreement of a predetermined price (Eaton and Sheperd 2001, Tripathi et al. 2005). This accords with the opinion of Strohm and Hoeffler (2006) that partnerships are very popular in developing countries because they provide several advantages, according to research conducted by Majid and Hasan (2014) and Wang et al. (2014), who find that the livestock system partnership provides economic benefits which make a positive contribution to the production and supply chain efficiency and the effect is also significant on the wellbeing of livestock farmers. Haryadi (2004) explains that the partnership is a business strategy conducted by two or more parties within a specified period to make a profit along with the principle of mutual need and mutual rearing. Various patterns can be applied in the partnership such as profit-sharing system, the core pattern of plasma, general trade pattern, the pattern of the agency, and warabala.

The general rule of the pattern of production is based on mutual trust, determined by an informal agreement between the investor (cow owner) and the breeder, whether it concerns the capital or the share of the business. The deal is based on the progeny of the livestock, with the rules of distribution following two models: based on the number of livestock births and the sale value of the young cattle (Firmansyah et al. 2006). The profit share system pattern has long been implemented in Indonesia on beef cattle farms. Widarto (2014) explained that this form of the agreement applies throughout Indonesia with a variety of local indigenous terms such as “maro” (Java), “nengah” (Structures), “teseng” (South Sulawesi), “toyo” (Minahasa), and “perduwa” (Sumatra).

In South Sulawesi Province, more than 90% of the Bali cattle are managed by smallholders (cattle farmers). The Bali cattle are one of the most critical assets owned

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or managed by smallholders/cattle farmers in rural areas of the South Sulawesi Province (Mappigau et al. 2015). The central Enrekang district in Maiwa District is one area where farmers develop beef cattle businesses using both the traditional sharing system (Teseng) and the profit share system with the institution of the Maiwa Breeding Center (MBC). The Maiwa Breeding Center runs a ranch, and aims to be a center for the development of local industry based on science and technology. In the Maiwa Breeding Center, the cattle population increased by as many as 258 by 2016, and by 2017 the cattle population numbered 485 cows. This increase is similarly reflected in the number of partners now 37 breeder farmers with the number of cows in the sharing system amounting to 70 head while in the year 2016 there were 17 people involved (Andrian 2017). The existence of beef cattle farmers following a positive revenue sharing system is seen as one way to achieve prosperity for farmers. Therefore, this research aims to analyze the differences between the traditional profit share system and the institution profit share system.

MATERIALS AND METHODS

The research was conducted in February and March 2018. Data collection was carried out in the Maiwa District, Enrekang. The location was selected for having beef cattle farmers who still follow the traditional sharing system and also those that have adopted a sharing system with universities through the Maiwa Breeding Center. This is a quantitative and descriptive research study of the incomes of beef cattle farmers from the traditional sharing system and institution one. The research population is all beef cattle farmers who apply the different sharing systems amounting to 74 people. The samples are breeders of beef cattle following the traditional sharing system amounting to 37 people and farmers in the sharing system with MBC amounting to 37 people. The sampling technique used is a purposive sampling of farmers following a sharing system. Quantitative data is numerical and qualitative data comprises the responses of the breeders describing their sharing systems. Sources of data are primary data from interviews and secondary data from relevant sources. Methods of data collection were observation and interview (Riduwan 2002). Analysis of the data used is descriptive and statistic calculating income = total revenue - total costs (Dogan 2016).

RESULTS AND DISCUSSION

Characteristics of the Breeders

The characteristics of breeders who follow the two systems can be seen in **Table 1**. In conducting a cattle business, the farmer acts as a decision maker who seeks to make effective and efficient decisions in running and managing his or her business. The socio-economic characteristics of farmers (business scale, number of cattle, the age of farmers, level of education, farming experience, number of dependents in the family) can influence decision making and the profit of the business (Hartono and Rohaeni 2014).

Table 1. Characteristics of beef cattle breeders who followed an institution sharing system and the traditional sharing system

Characteristics	Description	Institution Sharing system (%)	Traditional Sharing system (%)
Age	0-14	0	0
	15-30	9.53	0
	31-46	50	61 .2
	47-62	35.71	29 .7
	63-80	4 .76	3 .1
Education level	Senior High School	11 .4	46 .8
	Junior High School	45 .5	23 .4
	Elementary school	38 .6	21 .8
	No school	4 .5	8
Experience of farming	1-4	75	29 .6
	5-8	12 .5	43 .6
	9-12	12 .5	26 .5
Number of family members	1-2	18 .2	1 .5
	3-4	34 .1	73 .3
	5-6	47 .7	25 .2
Number of livestock owned	1-5	66 .7	68 .7
	6-10	23 .07	17 .2
	More than 10	10 .26	14 .1

Table 1 shows that the beef cattle farmers who follow both the institution profit share system and traditional profit share are of childbearing age (15-64 years), which means cattle farmers have the physical ability to manage a beef cattle business. Jermias et al. (2017) reported that the age of farmers has a strong influence mainly concerned with the ability to provide food for the animals grown on the farm or of green fodder generally located relatively far from the location of the livestock. Murwanto (2008) reorted that the farmers whose businesses prospered typically have a dynamic mindset and excellent physical ability in managing their business. The younger a person's age, the more willing they are to accept external changes because livestock farmers always want to try something new to increase their knowledge and skills in diversifying their business.

Regarding education, beef cattle farmers who follow the system of partnerships with the institution profit share system are mainly at secondary level (45.4%), suggesting that these cattle farmers already understand the advantages in following a profit share system with an institution, while beef cattle farmers who follow a traditional profit share system are also mainly at the secondary level (46.8%). The level of one's education affects one's perspective. Higher education will lead to a more advanced perspective of the business, including the beef cattle business profit share system. This supports the findings of Badriyah and Setiawan (2012) that education affects the learning process and that better education improves the farmer's ability to assimilate information. Also in line with the opinion of Mahmud (2013), farmers with formal and informal education will have extensive knowledge and insight making it easier to respond to an innovation that is

Table 2. Sharing system mechanism

Description	Institution sharing system	Traditional sharing system
Cattle Purchase system	There is an agreement between the universities steeper and breeders 60:40	Financiers apply their estimates of cattle prices 50:50
Assistance	College assistance	No co-
Insured risks	The insured risk is borne by the university on condition of written agreements	The insured risk is borne by the breeder
Provision of fodder	Land for cattle feed is provided by the college	No particular land used for feed
Cooperation agreement	Written	No written agreement

beneficial to their business. This also conforms by Hasnudi et al. (2018) that the level of education is also associated with an increase in income of beef cattle ranchers

Farmers of beef cattle who profit share with an institution mainly have 5-6 years (75%) experience of cattle raising, while farmers who follow the traditional profit share system generally have 7-8 years (43.6%). The cattle raising experience of the respondents strongly affects the conduct of the business, as according to Mastuti and Hidayat (2014) the experience of raising livestock affects how to respond to innovation. The longer the experience of raising cattle, the higher the level of response to technology will be. This is also in line with the opinion of Hasnudi et al. (2018) that cattle breeding experience positively influences the increase in income of beef cattle ranchers.

Regarding the number of family members of farmers who follow the profit share system with the college, the highest number is 5-6 people (47.7%), while the number of beef cattle farming family members who follow the traditional profit share system is 3-4 persons (73.3%). The number of family members influences the managing of a business according to Rahmah (2014), who finds that the number of members of the family can affect business activities because these family members can supply workforce availability to assist its activities.

The number of livestock owned in the institution profit share system was on a scale of 1-5 (66.7%) while the system of traditional profit share was on a scale of 1-5 individuals (68.7%). This means that farmers who follow the college system profit share and the traditional profit share system both have small-scale ownership of livestock. In line with the statement by Kariyasa (2005), the lack of beef cattle population is partly due to the high number of poultry kept by small-scale farmers with limited land and capital. While Kusnadi (2008) stated that capital is the limiting factor. At this time, the level of livestock ownership on relatively small farms is 1-3 cattle, 3-5 goats/sheep, and 5-20 birds. Gross revenues of livestock farmers are still not enough to meet the needs of farmers and their families. Farming is an important additional source of income to sustain the needs of farming families, especially in rural areas.

Profit Sharing System Mechanism

Table 2 shows the purchase of a cow under the institution profit share system that the institution and prospective farmers jointly estimate the price of a cow to be maintained.

The profit share system is a state in which a person can raise livestock (cattle) obtained from others, accompanied by a specific rule on the financing and distribution of the results. Those who raise livestock for other people under this livestock system are from now on referred to as breeders, in contrast to the owners of the livestock. In essence, livestock owners are divided into two kinds, governmental and nongovernmental. Thus there is a fundamental difference in the outcome distribution system to provide different effects on farmers' income earned on one unit of a particular breeder (Muhzi 1984).

According to the results shown in **Table 2**, the manager of the institution and the farmer agree on the price of a cow to be maintained. Whereas in the traditional system, the owners of the capital make their estimate of the initial price of the cattle without discussing this with the farmers who raise the animals. The purchase of cattle shows activity of social interaction between the manager and the institution in the institution profit share system, supporting the opinion of Ahmad et al. (2004) that social interaction occurs when the contact occurs in a community. Social contacts in the community are an absolute requirement in the process of social interaction.

Regarding assistance, the management system for the college institution has many programs to empower its members and provide assistance to breeders and farmers to assist in the running of the business system profit share. The teaching farms assist the farmers regarding technology and serving members of the group providing consultation on livestock husbandry and improving the health of cattle. The Institution assists the farmers who follow the system to increase their earnings, this is in accordance with the opinion of Hikmat (2001) and Nono (2011) that the empowerment of farmers is a method that allows people or society to improve the quality of life and can enlarge its influence on the processes that affect their lives, while in the traditional system the beef cattle farmers do not receive the assistance of the owners of capital. Farmers in the traditional profit share system can only obtain advice from the extension associated with the beef cattle business system.

Regarding insurance risk to the farmers of beef cattle that followed the institution profit share system, this can be minimized because of the attention of the institution manager. If livestock fall ill and it is immediately reported it will be handled directly by the institution as well as if the cattle die, and as already reported earlier the farmer will not replace the loss of livestock. While under the traditional system profit share coverage of the risk is

Table 3. Difference between revenues of breeders of cattle in profit share-based systems

Type of profit share	Average Revenue (IDR / head/cattle/year)	Average Total Cost (IDR/ head/cattle/year)	Average income IDR / head/cattle/year)	Revenue after share (IDR/cattle/head/year)
Institution	2,300.000	912.000	1.388.000	833.280
Traditional	1.245.000	185.500	1.059.500	529.750

borne by the owners of capital and the problems that arise are resolved by way of consensus, conforming with the opinions of Sanjaya and Sudarwati (2015) that if there is a risk then the cost of losses is born by the owner of an animal while the breeder does not bear any cost because of the risk posed not because of the element of intent. Solving problems not in the courts due to feelings of pity, their kinship, and recognition of the existence of the law of karma that God will reward good deeds and not the herdsman who is cheating.

What cattle feed in the profit share institution system is provided by the Maiwa Breeding Center. Farmers who can take the feed directly from land that has been planted with grass, but instead of replacing the beef cattle farmers' feed costs by helping at events in the area of the institution. Whereas in a traditional profit share feed system it is not provided by the owners of capital, so the breeder grazes the cattle on a freelance basis. The feed will determine the success of the beef cattle farm; this is by the opinion of Ahmad et al. (2004) that the continuity of supply of feed will determine the success of the cattle business because all the cows are in the barn. Continuous feeding can cause stress, and that can affect cattle and they become susceptible to various diseases and stunted.

A cooperation agreement is made between the farmers of beef cattle with the profit share system manager authorized in writing to maintain a relationship of cooperation between the two sides making it easy to plan the beef cattle business. The agreement includes a system profit share agreement that is 60:40. The requirements made by the management of the institution are authorized in writing so that farmers know their rights and obligations in running the beef cattle business. Systems with a contract agreement by the opinions of Sanjaya and Sudarwati (2015) that the agreement contains several detailed rules will provide better legal protection for businesses. While the traditional profit share system does not include a written consent agreement, it is the opinion of Sirajuddin et al. (2016) and Sirajuddin et al. (2014) that the implementation of cooperation is based on trust.

Analysis of Income

The farmers' income on beef cultivation with a different yield system can be seen in **Table 3**. Income analysis consists of a cost-benefit analysis, with income obtained through input-output analysis (Murti and Astuti 2017, Trisbudi and Ristyawan 2017). Companies are considered profitable if the value of income is positive and vice versa unprofitable if the value is negative. The farmers' income on beef cultivation with a different yield system can be seen in **Table 3**.

Table 3 shows that the average income earned by farmers from the institution system is higher than that obtained from the traditional production system and that the income comes from the sale value of livestock in the first year of maintenance. The average total cost incurred by farmers for growing beef with the higher education system is higher than the average total cost of growing cattle with the traditional sharing system. The total cost obtained from the average fixed costs coupled with variable costs is by the opinion of Sundari et al. (2009) that income is revenue minus total cost. Businesses are considered profitable if the value of income is positive and otherwise unprofitable if the value is negative. While the income earned by cattle farmers and breeders with the institution system is IDR 1,388,500/ head/cattle/year where the value of income is higher than the income of the beef cattle farmers with the traditional sharing system. Revenue earned by farmers following the institution sharing system is IDR 833.280 head/cattle/year, and revenue earned by farmers from the traditional sharing system is IDR 529.750 head/year. In South Sulawesi Province, more than 90% of the Bali cattle are managed by smallholders (cattle farmers). Despite the Bali cattle being one of the essential assets owned or managed by smallholders/cattle farmers in rural areas of the South Sulawesi Province. However, there are challenges in the beef cattle supply chain about the cattle farmers. Cattle farmers get a lower price when they sell their beef cattle, even though at the time the price of Bali beef on the consumer level is very high (Sundari and Triatmaja 2009). Hence, the contribution of beef cattle income to farming households is small, ranging from 15% to 26% (Hartono and Rohaeni 2014). The small contribution of beef cattle income to farming households is also reported by Pica-Ciamarra et al. (Demir et al. 2015, Mardani et al. 2014, Pica-Ciamarra et al. 2011) in many developing countries, such as Bangladesh, Ecuador, Ghana, Guatemala, Madagascar, Malawi, Nicaragua, Nigeria, Nepal, Pakistan, Panama, and Vietnam. This shows that there is a need for improving supply chain collaboration practices to increase cattle farmers' income in developing countries, such as Indonesia.

CONCLUSIONS

As conclusion, given the differences in the system mechanisms for the institution (University Maiwa Breeding Center) and Tesang (traditional) systems, namely the cattle purchasing system, assistance, risk

coverage, feed provision and cooperation agreements and livestock income from the institution system are higher than those for the traditional (Tesang) system. Therefore, we need to improve the trust between beef cattle breeders with the manager of the institution.

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