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## ROOT PROBLEM OF SUPPLY CHAIN COLLABORATIVE PRACTICES AND STRATEGIES TO IMPROVE COMPETITIVE ADVANTAGE OF SMALLHOLDERS BEEF CATTLE FARMING IN RURAL AREAS

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### Abstract

Low competitive advantage of smallholders beef cattle farming is a serious problem to enhance the livelihood of rural smallholders in developing countries, including Indonesia. The low competitive advantage of local beef cattle demonstrates a noticeable difficulty in terms of collaborative practices between actors in supply chain. Therefore, this study objectives is to explore root problems of collaborative practices, determine which the root problems cause low competitive advantage of smallholders beef cattle farming. Then, formulate strategies to improve the competitive advantage based on the root problems. The study was organized in three phases of research methods. In first phase, survey research method and Relative Important Index (RII) were used. In second phase, focus group discussion (FGD) and Fishbone analysis were used. In third phase, FGD and formulation strategy analysis was used. The results of the first phase, RII analysis show that there are slightly different perception among smallholder and traders on main root problems of collaborative practices. Thus, the result of the second phase, participant of the FGD agreed that goal congruence with information sharing was a root problems which cause the low competitive advantage. And finally, the result of third phase, participant of the FGD suggested key strategies to improve the competitive advantage, namely developing social capital, improving technologies and farm management practices, improving beef cattle logistic system, and organizing smallholder and traders into beef cattle supply chains groups.

**Keywords:** Smallholder, traders, collaborative practices, root problems, competitive advantage, local beef cattle

## Introduction

In Indonesia, beef cattle plays an important role in poverty reduction in rural areas as more than 98% of all beef cattle is produced by smallholders. For the smallholders, beef cattle are valuable capital assets that not only as source of income and provide employment to the household, but also increase numerically through reproduction. Beef cattle are often considered to offer better rates of return than the interest paid by banks or savings institutions. Beef cattle also provide a buffer against the risk of crop failure, thereby stabilizing food supply (Otte et al., 2012). According to Directorate General of Livestock and Animal Health Resources (2016), the population of beef cattle in Indonesia at present is 23.12 million and most of them are local cattle breeds such as Bali Cattle (*Bos Sondaicus*). The local beef cattle farming is not evenly spread out between all provinces of the country where the production is centered in South Sulawesi, West Nusa Tenggara, and Bali.

The local beef cattle are adaptable to local environmental risks and use available natural resources efficiently. And also, beef of the local beef cattle is much in demand by consumers because of its higher carcass percentage with a lowest fat content and cholesterol (Purwantara et al., 2012; Patrick et al., 2010). Despite the local beef cattle has a comparative advantage, however, its competitive advantage is low. This can be seen from the beef quality has not meet the standards of modern and industrial markets, besides the price is much higher than imported beef. This condition leads most consumers were switch their consume from local beef to imported beef and chicken meat (Ilham, 2009). A report by Rouf et al., (2014) showed that local beef cattle from smallholder farmer had a lower competitiveness compared to the local beef cattle from company.

Wen Huang and Sheu (2005) and (Giha, 2008) suggest that the opportunities of improving competitive advantage of beef cattle come mostly from collaboration among partners. However, little empirical study conducted in developing countries to know the role of supply chain collaboration among partners in improving the competitive advantage of the beef cattle. Further, several studies have been conducted to examine the relationship between supply chain collaboration and competitive advantage (e.g. Vanathi and Swamynathan, 2014; Mathuramaytha, 2011). However, the previous studies were conducted in the manufacture sector and have paid little attention to roots problems of collaborative practices as a cause of low competitive advantage. In beef cattle sector, collaborative practises among partners are extremely difficult to establish and slow to develop because of lack of coordination, antagonistic relationships, and asymmetric information between actors (Leat and Giha., 2008; and Giha., 2008). Therefore, supply chain collaboration analysis in beef cattle should be able to identify root problems of supply chain collaboration for attention when attempting to improve competitive advantage (Jie and Parton, 2009). This study aims to fill the literature gap by determining the root problems of supply chain collaborative practices cause of low competitive advantage of local beef cattle from smallholders and formulate key strategies to improve the competitive advantages

## Literature Review

Compared to supply chain systems in other industries, there are some unique challenges presented in beef supply chain. Those unique challenges from the aspects of supply chain structure and the flows of product, information and finance. First, the industry consisted of many unorganized parties and coordination between them has been lacking. Also, many smallholders dispersed across wide geographic areas, which made coordination extremely difficult. In addition, the relationships among segments have traditionally been adversarial in part, as a result of intensive negotiation over beef cattle prices and volatile margins over time. Second, the product flow was not synchronized with market demand. Smallholder did not receive clear economic signals to help them developed production plans based on the market demand. The mismatching of supply and demand often faced by smallholder because they carry too much inventory, which resulted in significant length production cycles over time and created facility utilization inefficiency. Third, a unique problem in beef industry was related to the information flow. Specifically, smallholder rarely received information of carcass quality or consumer preferences. This was especially true when live cattle were sold or dressed weight basis.

Without necessary information, smallholders cannot improve feeding operations to increase beef cattle quality, and they cannot select appropriate genetic breeds to meet the market demand. At last, the challenge to the beef supply chain came from the financial flow or beef pricing, smallholder negotiated face to face with traders about the selling price for beef cattle. These transactions for individuals' pens of beef cattle were made at an average price, often termed pricing on the average, and there

were no economic incentives for the smallholder to raise a high quality of beef cattle (Wen Huang and Sheu, 2005) Cao and Zhang (2011) defined supply chain collaboration as a process of a partnership in which two or more companies self-organizing cooperation in planning and executing the operation of a supply chain toward a goal together and benefiting each other. Fearne (1998) mentioned that collaboration creates co-operative and sharing between partners, namely share experiences, share market information, share plans and share knowledge. Tsai (2006) mentioned that the collaboration between supply chain actors needs trust and commitment to share the risk, knowledge, and resources. Giha (2008) pointed out that there are four key aspects of supply chain collaboration, namely : (1) partnerships are entered into freely, (2) partnerships must offer mutual benefits; (3) these benefits occur over time, and (4) partners remain substantially independent.

For a functional product like beef, the opportunities of improving competitive advantage come mostly from collaboration among partners (Wen Huang and Sheu,2005). Cao and Zhang (2011) showed that supply chain collaboration improves collaborative advantage and indeed has a bottom-line influence on firm performance, and collaborative advantage is an intermediate variable that enables supply chain partners to achieve synergies and create superior performance. Competitive advantage is the extent to which an organization is capable of create and preserve function over its competition (Chen et al., 2006). Competitive advantage consists of 5 (five) dimensi namely: competitive pricing, premium pricing, value-to-customer quality, dependable delivery, and production innovation Fearne (1998) stated that generally, there were five benefits that can be obtained from collaboration on the beef cattle supply chain, namely improved market access, improved communications, higher profit margins, and greater discipline.

Collaboration can also provide benefits for smallholders in terms of cost and value. Based on the cost side, guaranteed access to a high volume market not only reduces market risk but also provides opportunities for economies of scale in the production process. Improved communications result in shorter lead times, lower stock levels and reduced waste, potential cost savings. On the value side, better knowledge of what consumers want and how they make purchasing decisions was invaluable when differentiating meat products. Giha (2008) argued that successful collaborative efforts within the beef cattle supply chain may help farmers by assuring market access, and in this sense reducing the marketing cost of searching for appropriate buyers.

## Materials and Methods

In this study, the research method consisted of three phases. In the first phase, a survey research method was adopted to identify and determine root problems of collaborative practices in supply chain of local beef cattle. The survey conducted in Bone and Bulukumba regencies, which were selected by purposive sampling due to these regencies had larger local beef cattle herds in South Sulawesi Province. From each of these regencies, two villages were selected by purposive sampling as sample location. Thus, as many as 48 smallholder respondents for each of these villages were chosen by random sampling technique. And then, 26 trader respondents were selected by snowball sampling technique. Data were collected through a structured questionnaire with using 5-point Likert scale items that ranges from 1 (strongly *not important*) to 5 (strongly *important*). To measure supply chain collaboration, dimension of the supply chain collaboration were adopted from Cao and Zhang (2011) including : information sharing, goal congruence, decision synchronization, incentive alignment, risk sharing, sharing resources, joint activity, joint communication, and joint knowledge creation.

Further, to measure competitive advantage, dimension of competitive advantage were adopted from Mathuramaytha (2011) including : price/cost, quality, and time to market. Smallholder and trader respondents were asked about root problems which they perceived as an important to implement supply chain collaboration between actors. Further, participants of FGD were discussed which the important root problems as cause of low competitive advantage of smallholders beef cattle farming, (namely price, quality, and time to market of beef cattle over its competitors). The relative importance index (RII) method was utilized to determine relative ranking of the root problems cause of low competitive advantage of , which the scores are transformed to importance indices based on the following formula (Narbuko dan Achmadi, 2004) :

$$RII = \frac{\sum_{i=1}^5 wixi}{\sum_{i=1}^5 xi} \dots\dots\dots(1)$$

where RII is relative importance index, i is category index responds (1,2,3,4 and 5), wi is weights associated with the i-th respondent (1, 2, 3, 4, 5), and Xi = Frequency of the i-th response as a percentage of total respondents for each factor. In the second phase of the research, a focus group discussion (FGD) method was used to validate the result of the RII analysis, and determine the root collaborative practice problems cause the low competitive advantage of the smallholders beef cattle farming. In the FGD, as many as 30 participants which consist of 15 participants representative of smallholder and trader respondents, 10 participants representative of local government staff, and 5 participants representative of researchers were invited to participate in discussing through one-day seminar. For determining the root problems of collaborative practice that cause of the low competitive advantage of smallholders beef cattle farming, fish bone (cause-effect) diagram was applied through 5 Why methods as suggested by Bose (2012). The competitive advantage was measured by 3 dimension which adopted from Ferry et al. (2007), consisted of beef cattle price, beef cattle quality, and the length time to market.

In the third phase of the research, a focus group discussion (FGD) method was used to formulate key strategies to improve competitive advantage of smallholders beef cattle farming. As many as 30 participants from FGD of the second phase were invited again to participate in the FGD of the third phase of research. In this FGD, participants formulated key strategy based on the root problems cause of the low competitive advantage (problem solving analysis). Sequential of the three phases of research methods in this study are illustrated in Figure 1

**Result and Discussion**

Table 1 presents result of the relative importance index (RII) analysis for each dimension of supply chain collaboration, which become problems in collaborative practices, Table 1 illustrates the three highest ranking problems of collaborative practices, which are considered important by the smallholders:

- Information sharing as the first rank of root problem with RII = 0.84. The reason for this, the smallholders perceived that information sharing is very essential for successful supply chain collaboration. However, the information exchange is very difficult to be realized in collaborative practises since a little bit of market information are shared by the traders to the smallholder.
- Incentives alignment as the second rank of root problem with RII = 0.77. The reason for this, the smallholders perceived that incentives alignment is the other reason for successful supply chain collaboration. However, the incentives alignment is difficult to be realized in collaborative practises since the traders do not want to share their benefit to the smallholder fair and proportionately. Although greatest benefit of the increase in the price of local beef only enjoyed by the traders while the smallholders who bear a greatest risk of actually enjoying the small one
- Decision synchronization as the third rank of root problem with RII=0.66. The reason for this, the smallholders perceived that decision synchronization is the other reason for successful supply chain collaboration. However, the decision synchronization is difficult to be realized since the traders never involving smallholder in a common decision about how to fill sustainable beef cattle supply, how to produce beef cattle that suitable for customer needs and desires, and how to save on the supply chain cost.

On Table 1, the three highest ranking problems of collaborative practices, which are considered important by the traders :

- Goal congruence as the first rank of root problem with RII = 0.85. The reason for this, the traders perceive that main barrier of collaborative practises are associated with goal congruence. Because the smallholder do not want to work together with traders towards the common goal. The smallholders have the lack of insight and knowledge to the problem of management. In addition, between the traders and farmers have a difference in the business orientation, since the traders' business activity are based on market and profit oriented while the smallholder in keeping beef

cattle are as a part-time activity and an away of investing or saving money

- Information sharing as the second rank of root problem with RII = 0.78. The reason for this, the traders perceive that the another barrier of collaborative practises are associated with information sharing. Because the traders difficult to shared their market information to the smallholder due to majority of the smallholder have low level of education and hence, they unable to develop their beef cattle production plans based on the market information
- Decision synchronization as the third rank of root problem with RII = 0.74. The reason for this, the traders perceive that another barrier of collaborative practises are associated with decision synchronization. Because the traders make decision to sell beef cattle based on more business consideration while smallholder sells their beef cattle based on consideration pressured of cash needs or requiring the cash to the needs of life his family

Based on the result of the RII analysis above, it seems that among smallholder and traders have different perception about the root problems of collaborative practices. To overcome the difference, FGD was undertaken to validate the results of the RII analysis as well as determine the root problems cause of low competitive advantage as showed on Figure .2 that FGD in second phase of this research, participants agreed that goal congruence with information sharing was a highly ranked of the root problems which cause the low of competitive advantage of smallholders beef cattle farming. The main reasons of the participant that the goal congruence and information sharing ware a key indicator to establish successful collaboration in supply chain and its could be a source of competitiveness of smallholders beef cattle farming. These reasons are supported by the literature, Dyer and Singh (1998) argued that in situations where there is goals congruence, firms will share their information in order to achieve goals that are mutually beneficial since information sharing routine are a source of competitive advantage. Jie et al. (2007) stated that goal congruence and information sharing shows solid relationships among chain members in collaborating.

The chain members exchange information on a regular basis, to be able to work as an entity, together they can understand well the needs of customers, and consequently, they can respond to the market change quicker. Huang and Sheu (2005) pointed out that one problem causes inefficiency of beef cattle supply chain in many developing countries is related to information asymmetry, which smallholder has limited information about the price, carcass quality, and consumer preferences. Without adequate information, the smallholder cannot improve feeding operations to an increase their production scale, beef cattle quality, and they cannot select appropriate genetic breeds to meet the market demand. In addition, Lee (2000) argued that improved sharing information should result in shorter lead times, lower stock levels, reduced waste, potential cost savings, decrease bullwhip effect of market demand, and subsequently improved the competitiveness of beef cattle production.

Finally, based on the result of previous FGD, the participants of the FGD in third phase of this research formulated key strategies to improve competitive advantage of smallholders beef cattle farming. First, enhancing smallholders ability to negotiate with traders. Limited bargaining power can force smallholders to buy inputs and equipment at higher prices but to accept lower prices for their produce. If they had greater bargaining power, they would have a better chance to determine market prices for their products (FAO 2013). Second, developing social capital in collaborative practices. This strategy is supported by the literature that developing social capital in the supply chain collaboration creates a cohesiveness for members to work together effectively (McGrath et al., 2005). Thus, Shanthilakshmi and Ganesan (2013) argued that the potential of the firm create competitive advantage depends not solely on its own resources but also on social capital as a catalyst which nurtures the successful external relationship. Second, improving technologies and farm management practices. This strategy is supported by Oaigen et al. (2013), and Permani (20213) who pointed out that in order for beef cattle farming to be both profitable and competitive, smallholders need the skills and knowledge to make better technology and farm management practices. Third, improving beef cattle logistic system.

This strategy is supported by Harianto (2013) who suggested in creating meat market local to be more competitive, the improvements logistic beef must be done because with logistic systems at present, where transportation facilities are inadequate and administration is very complex. These resulted in difficulty, slowly, and high cost for distributing beef cattle from the production regions to the consumer regions. Fourth, organizing smallholder and traders into beef cattle supply chains groups. This strategy is consistent with the result of the previous study, Mujeyi et al (2015) found that formation of cattle supply chain groups is important to lower transaction costs and increase access to market information is

highly recommended. Marandure (2015) pointed out that marketing groups are considered an important strategy with the great potential to encourage smallholder to participate in formal cattle markets. This because of individual smallholder cattle producers do not have sufficient animal numbers to meet the supply requirements for large high-value formal markets. In addition, by marketing groups, smallholder can potentially achieve greater economies of scale in accessing relevant services such as transport, information, and infrastructure. Fearne (1998) argued that there are five advantages of belonging to a producer club as far as the livestock industry in general: (1) improved market access; (2) improved communications; (3) higher profit margins; (4) greater discipline; and (5) the creation of barriers to entry. Giha and Leat (2008) found that a producer club has the possibility of both reducing demand uncertainty and also reducing the price variability that comes from problems of inferior carcass specification. Furthermore, farmers also have the possibility to achieve a higher price (through a higher premium).

### Conclusion and Future Research

The results of the first phase of the research showed that smallholder and traders present a slightly different perception of root problems for implementing supply chain collaboration. The smallholder perceives that the information sharing was the highly ranked of the root problems, while traders perceive that goal congruence was the highly ranked. However, in second phase of the research, FGD participants agreed that goal congruence with information sharing was the highly ranked of root problems cause of low competitive advantage. Based on the root problems cause of low competitive advantage, FGD participants in third phase of the research formulated key strategies to improve the comparative advantage, namely (a) developing social capital in collaborative practices, (b) improving technologies and farm management practices, (c) improving beef cattle logistic system, and (d) organizing smallholder and traders into beef cattle supply chains groups

Although the result of this study could provide a contribution to the body of literature on supply chain management by providing methods of problem-solving in supply chain collaborative practices, thus to improve the competitive advantage of the smallholders beef cattle farming. We believe that this study has several limitations, such as sample respondent do not involve another main chain members such as butcher and beef distributor is suggested for further research. In addition, this the results of these studies do not provide a sufficiently strong argument about trader and smallholder difficulty to realize collaborative practices and how important of social capital lead to this issue is also suggested.

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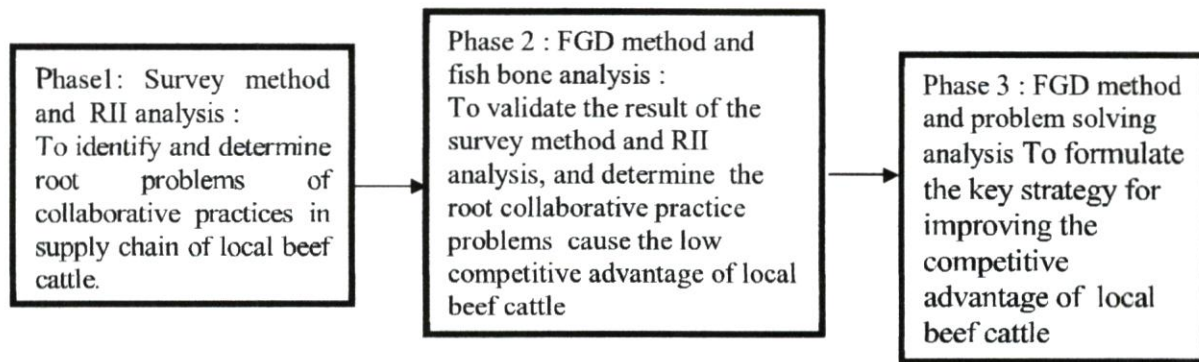
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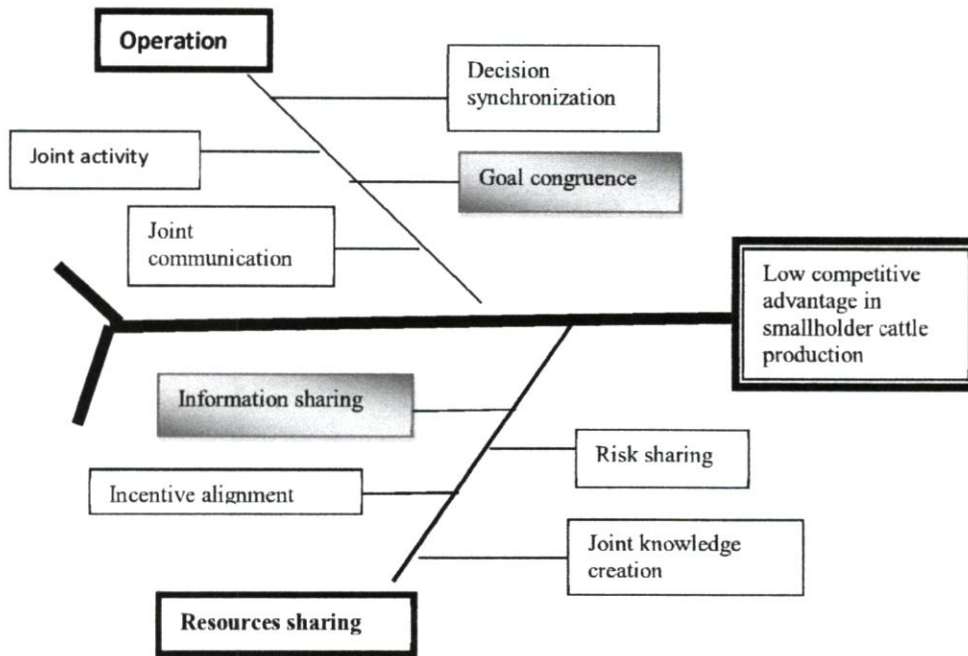
**Table1: RII index and rank problem of collaborative practices**

Collaborative problems	Smallholder		Traders	
	RII	Rank	RII	Rank
Information sharing	0.84	1	0.78	2
Goal congruence	0.65	4	0.85	1
Decision synchronization	0.66	3	0.74	3
Incentive alignment	0.77	2	0.54	8
Risk sharing	0.59	8	0.7	4
Joint activity	0.64	5	0.6	7
Joint communication	0.6	7	0.63	5
joint knowledge creation	0.63	6	0.61	6

Source : Mappigau et al.(2014)



**Figure 1: Sequential of the research methods**



Source : Mappigau et al.(2014)

**Figure 2. Fish bone diagram : Root Problems of collaborative practices cause low competitive advantage of the smallholders beef cattle farming**