PROCEEDINGS
The 7th ISTAP
International Seminar
on Tropical Animal Production

September 12 – 14, 2017, Yogyakarta, Indonesia

"Contribution of Livestock Production on Food Sovereignty in Tropical Countries"

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Address: Faculty of Animal Science, Universitas Gadjah Mada
Jl. Fauna 3, Kampus UGM, Bulaksumur, Yogyakarta 55281, Indonesia
Phone: +62-274-513363/+62-274-560868
Fax: +62-274-521578
Email: istap@ugm.ac.id
Website: www.istap.ugm.ac.id
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(Universitas Gadjah Mada, Indonesia)

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PREFACE

On behalf of Faculty of Animal Science, Universitas Gadjah Mada, I am pleased to present you the 7th International Seminar on Tropical Animal Production (ISTAP) which is held on September 12-14, 2017 at Auditorium Dr. R. Soepardjo, Faculty of Animal Science UGM, Yogyakarta. Under the main theme “Contribution of Livestock Production on Food Sovereignty in Tropical Countries”, we expect that information and ideas on animal production systems in the tropics and its related problems will be shared among participants, thus we can elaborate an integrated approach in developing sustainable tropical animal production. I believe, this can be achieved since more than 200 animal scientists, researchers, students, and producers from more than 10 countries join this seminar.

In this moment, I have to address my great thanks to all people who have contributed for the success of this seminar. First, to all participants, thank you for your contributions, time, and efforts in participating in all sessions in this seminar. We also would like to extend our gratitude to the reviewers and editors for dedicate their expertise and precious time in reviewing and editing the papers. I deeply appreciate the hard work of all members of the Steering Committee, Organizing Committee, and students of Faculty of Animal Science UGM for making this seminar achieved a great success!

I hope all of you enjoy the seminar and Jogja as well!

Dr. Cuk Tri Noviandi

Editor in Chief
REPORT FROM ORGANIZING COMMITTEE

Dear all scientists, delegates, participants, ladies and gentlemen,

Praise to The Almighty for His Merciful and Beneficent to gather us in this memorable moment of scientists and delegates from all over the world who are interested in Tropical Animal Production field can meet up together.

On behalf of the Board of Committee, it is my great pleasure and honor to welcome all participants to attend the 7th ISTAP in Yogyakarta, the city where nature, culture and people live in harmony.

As a chair in this seminar, let me report that, today, we have distinguished participants from all over the continents in the world to present their paper with the theme of "Contribution of Livestock Production on Food Sovereignty in Tropical Countries". There are around 250 scientists, delegates, and graduate students from 11 countries attending the seminar, and more than 170 research papers will be presented during these three days seminar. The great enthusiasm of all participants to share their research-based valuable information and knowledge on livestock production development in tropical areas as well as to contribute on developing human prosperity all over the world is expressed.

The 7th ISTAP programs are rich of scientific programs as well as social and cultural activities. The scientific programs offer six plenary sessions, eight parallel sessions (both oral and poster presentation) each day, and rural field trip. The social and cultural programs of the 7th ISTAP are also important as the scientific programs since the scientists' interaction, intercultural exchange, friendship and future scientific or research collaboration are also central to this seminar. In the evening, participants will attend a warm invitation from the Dean of Faculty of Animal Science UGM in a Welcome Dinner that will give you the most impressive moment to attend. Rural field trip activity offers a wonderful experience to the rural livelihood surrounded by the spectacular natural landmark, Ancient Volcano in Yogyakarta where many smallholder farmers live in harmony. We will also accompany all participants to experience the ancient civilization by enjoying the beautiful of Prambanan temple. We do hope that participants will take part of these wonderful opportunities.

During the seminar, the 7th ISTAP committee also creates a competitive atmosphere among all participants by granting awards for those who have outstanding paper and poster. Participants are encouraged to share their precious works in research and knowledge dissemination in an attractive way. The awards will be given to the outstanding participants immediately after the last session of parallel presentations where the closing ceremony will also be held on September 13th, 2017 afternoon. I wish all of the participants enjoying activities that we have organized.

Finally, on behalf of 7th ISTAP Committee, let me express the high appreciation and acknowledgement to the Rector of Universitas Gadjah Mada and Dean of Faculty of Animal Science UGM for the advice and suggestion in organizing this international seminar. Recognition should go to the Steering Committee, Scientific Committee, Reviewers and Editorial Boards and All Technical Committee members who have worked extremely hard for the details of important aspects of the seminar programs.

Terima kasih (Thank you).

Sincerely Yours,

R. Ahmad Romadhoni Surya Putra, Ph.D
Chairman
The Organizing Committee of the 7th ISTAP
WELCOME ADDRESS

Selamat pagi. Good morning, and Assalamu‘alaikum Wr. Wb.

The honorable Rector Universitas Gadjah Mada, Invited Speakers, all of delegates, distinguished guests, participants, ladies and gentlemen.

First of all, it is our great pleasure and honor to extend a warm welcome to all of you at The 7th International Seminar on Tropical Animal Production (ISTAP), which be held on September 12 - 14, 2017 at Auditorium Drh. R. Soepardjo, Universitas Gadjah Mada, Yogyakarta, Indonesia. This seminar is proudly organized by Faculty of Animal Science Universitas Gadjah Mada, every 4 years since 1994. But, since last two years (2017) ISTAP has been conducting for every two years in collaboration with the Indonesian Society for Sustainable Tropical Animal Production (ISSTAP). We consider due to the rapid development of science and technology in animal production and also the need for exchange knowledge and experiences among the stakeholders, this scientific event is conducted for every two years.

The contribution of this seminar to the development of national food security is truly significant for introducing of new scientific knowledge and equipment that is much needed in Indonesia to maintain a safe and secure environment and to look at more effective ways to meet and anticipate the future challenges. We can see great enthusiasm of the entire participant to present their latest research finding as well as to share valuable information and knowledge for human prosperity all over the world.

In these 3 days of seminar, we have invited some important distinguished speakers for the plenary session and invited papers relevant to the animal production challenges for sharing their valuable information and knowledge. Other participants from over 11 different countries and from research institute and/or universities can deliver their precious research through oral and poster presentations at concurrent sessions.

At this opportunity, we would like to express our special thank you to the Steering Committee, Scientific Committee, Reviewers and Editorial Boards for their great contribution to make the seminar a great success. Also, we would like to congratulate and deliver high appreciation to the Organizing Committee as the organizer for their great contribution and generous efforts to make the seminar successfully organized. We are really indebted to your valuable time, effort and sacrifice to the success of this seminar.

To all of the participants, I do hope this seminar will enrich you with the new perspective of recent knowledge and of course with new friends for possible future partnership and collaboration in fostering the advancement of animal science. Also, I wish to all of the participants having a great achievement of success and fulfill the expectation as well as enjoying the interaction with all participants. Surely, with all of our hospitality, we have been trying our best to make your brief visit to our country become a wonderful and memorable moments. We are looking forward to meeting you in the future event.

Finally, we wish you all a very pleasant and most enjoyable stay in Yogyakarta, Indonesia, beside your scientific journeys.

Thank you very much for your attention, Terima kasih, Wassalamu‘alaikum Wr. Wb.

Yogyakarta, 12 September 2017

Sincerely yours,

Prof. Dr. Ali Agus
Dean Faculty of Animal Science UGM
OPENING REMARKS

Dear Excellencies, Distinguished Delegates, Ladies and Gentlemen,

It gives me great pleasure to extend you all a very warm welcome on behalf of Universitas Gadjah Mada. We highly appreciate your participation in joining the 7th International Seminar on Tropical Animal Production hosted by the Faculty of Animal Science Universitas Gadjah Mada in Yogyakarta from 12-14 September 2017.

The theme of this conference is Contribution of Livestock Production on Food Sovereignty in Tropical Countries. We hope that this seminar will provide a perspective and insight into tropical livestock production systems and sustainable local resources management contribution in food sovereignty, also give a forum in order to exchange information and ideas on livestock production systems in the tropics and its related problems.

Food Sovereignty is a comprehensive concept which involves not only guaranteed access to food, but also to define their own food compatible with local resource potentials which may ensure food appropriateness and sufficiency. In the Livestock Production, Indonesia and other tropical countries have a variety number of livestock genetic resources and animal biodiversity. Those can be potential assets and capital to gain advantages in domestic and global market. However, achieving food sovereignty need a synergy to work together among government, people, farmer, researcher, and academia. These three days seminar denote those synergy among stakeholders in food sovereignty. We believe that challenges to realize the food sovereignty in tropical countries will be discussed; and technical solution as well as recommendation will be provided to solve the existing problems in tropical animal production.

Finally, on behalf of Universitas Gadjah Mada, we would like to congratulate and appreciate to the Faculty of Animal Science, UGM as the organizer for their great efforts to make the seminar successfully organized. To all of participants, I wish all of you have a very fruitful, dynamic and constructive seminar also great discussion and interaction with other scientists participating in the seminar as well as enjoying your time in Yogyakarta.

Thank you

Rector of Universitas Gadjah Mada
Prof. Ir. Panut Mulyono, M.Eng., D.Eng
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Determining the Cost of Beef Production from Cattle Fattening in the Smallholder Farming

Rini Widiati(*), Tri Satya Mastuti Wid(**), Tian Jihadhan Wankar(*)

*) Livestocks Agribusiness Laboratory, Faculty of Animal Science, Universitas Gadjah Mada
**) Meat, Draught, and Companion Animals Laboratory, Faculty of Animal Science, Universitas Gadjah Mada

Corresponding email: rini_w@ugm.ac.id

ABSTRACT

Cost of production is a key piece of information needed to make the best to economic decision when selling animal. The objective of this research was to determine cost of production of beef that was produced by the smallholder farming. The research was carried out from October 2016 to February 2017, with the method of case study on fattening cattle at two of farmers group at Sleman Yogyakarta who directly sell to livestock market. Thirty cattle fattening that ready to sale for slaughter from the two groups of farmers taken as a sample. Data collecting related of cattle price, fixed costs and variable costs during fattening period using survey method with deep interviews to farmers with questionnaires, as well as cattle body weight was estimated using a tool of measure tape. Cost of production analysis by using full costing method performed in this study. The results showed, (1) the cost of production for fattening cattle was IDR 40,509.00/kg live weight, and (2) the selling price of live cattle from farmers were IDR 44,579.00, farmers have got profit from cattle fattening amount of IDR 4,070.00/kg live weight. Farmers will suffer losses if the price of cattle under market condition drops below of production costs.

Key words: Cost of production, Cattle fattening, Full costing method

INTRODUCTION

Around of 30% of Indonesian beef consumption was fulfilled from imports and the rest (70%) of local beef. More than 90% of the local beef supply comes from smallholder farmer with small-scale enterprises resulting in a slow increase in production (Directorate general livestock and animal health, 2015; Widiati and Widi, 2016). The tendency to increase the slow production of beef, if there is no appropriate government policy support then domestic production will decrease and beef import will continue to increase (Widiati, 2014). The issue of the fulfillment of beef consumption is often faced with controversy related to the large amount of beef imports and the price of beef. The price of imported beef is cheaper than the price of local beef (APPHI, 2013), so if the import of beef is not restricted then the price of beef in the domestic market will be affected by the cheap imported beef prices and will harm the farmers, as well as threaten the existence of smallholder farming. As an illustration the price of beef in India is exported at a price of US $ 2.88 / kg or IDR 36.864 / kg. While Brazilian beef exported at an average price of US $ 4.52 / kg or IDR 57.856 / kg, and beef from Australia US $ 4.73 / kg or IDR 60,544 / kg, compared to the price of beef in Indonesia reached IDR 100,000.00 / kg (Anonymus, 2015). Furthermore, the local beef price compared to import in 2005 until 2013 as in Table 1 below.
Table 1. The price of local beef vs. import in 2005-2013 (IDR/kg live weight)

<table>
<thead>
<tr>
<th>Kinds of Beef</th>
<th>Year</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local beef</td>
<td></td>
<td>40,000</td>
<td>47,500</td>
<td>50,500</td>
<td>54,500</td>
<td>61,500</td>
<td>62,500</td>
<td>65,000</td>
<td>72,700</td>
<td>92,000</td>
</tr>
<tr>
<td>Import</td>
<td></td>
<td>36,411</td>
<td>44,610</td>
<td>46,740</td>
<td>48,472</td>
<td>57,940</td>
<td>55,842</td>
<td>42,000</td>
<td>44,000</td>
<td>54,000</td>
</tr>
</tbody>
</table>

Source: APPHI (2013)

It becomes a dilemma that high local beef prices will lower people's purchasing power. On the other hand, if the local beef price adjusts the cheap of imported meat, the farmer will lose and affect the decrease of farmer's welfare so that the farmers are less enthusiastic to raise beef cattle. As a result of further dependence on beef imports will more increasing. Under such conditions, the price policy should be based on local beef production costs, not on imports.

The cost of Production is an important part of the information needed to make the best economic decisions when selling livestock. The cost of production can determine the cost of goods sold, the method of determining the production cost is a way to calculate the elements of cost into the cost of production. In calculating the cost elements to be used in the calculation of cost of production, there are two approaches: full costing and variable costing (Aurora, 2013). It is said further that the full costing method applied in accordance with the rules of cost accounting in the calculation of a product enough to help reduce the occurrence of over costing or under costing caused by the occurrence of the distortion in calculating the cost. The calculation of production cost by using the method of Full Costing is an information of a factory that is needed to determine the cost of production and selling price determination. The aim of this study was to determine the cost of beef production that produced in small farmers farming by using full costing method.

MATERIALS AND METHODS

The research was conducted on October 2016 to February 2017. The object of this research is fattening cattle kept by farmers belonging to livestock group Purwo Mulyo and Sedyo Makmur of Sleman Regency Yogyakarta. Taken 30 fattening cows by purposive, based on the age of age 2-2.5 years and ready to be sold to butcher as samples. Some of the data used is part of data from thesis (Wardani 2017). Most of the fattening cattle in the market are Ongole breed (PO), Limpo and Simpo cattle and there is no difference in the price of beef in the market based on the types. Therefore, to get the average of the product and the cost of beef production, the sample is taken from the three types of livestock with each sample of 10 heads from 26 respondent farmers who sell fattening cattle to Butcher as consumers. Primary data collection to determine the value of the elements of production costs, the sale price of livestock using survey method, with direct interviews to the farmers of respondents by using of questionnaires.

Livestock that sold to butchers are generally not weighed, therefore to measure the fattening cattle production is measured chest diameter and body length, which then calculated the weight of sales (kg live weight) based on Lamboume formula (Djagra, 2001) as follows:

\[ W = 0.000368 \times G^{0.58} \times L^{0.75} \]

Where:

- \( W \) = Estimated weight (kg);
- \( G \) = Chest diameter (cm);
- \( L \) = Body length (cm)

Determination of selling price per kg live weight of beef, used approach as follows,
Selling price per kg live weight of beef (IDR/kg live weight) = \( \frac{\text{Selling price (IDR/head)}}{\text{Body weight (kg)}} \) \ldots (2)

Production cost in beef cattle fattening farming using full costing method with the following approach (Kay et al., 2004)
\[ \text{TC} = \text{FC} + \text{VC} \]

where,
- \( \text{TC} \) = Total Cost (IDR/kg live weight/length of fattening)
- \( \text{FC} \) = Fixed Cost (IDR/kg live weight/length of fattening)
- \( \text{VC} \) = Variable Cost (IDR/kg live weight/length of fattening)

Production cost of beef (IDR/kg live weight) = \( \frac{\text{PS} - \text{PF}}{\text{SP}} \) \ldots (4)

Where,
- \( \text{PS} \) = Price of cattle ready to be slaughtered (IDR/head)
- \( \text{PF} \) = Price of cattle to be fattened (IDR/head)
- \( \text{SP} \) = Selling price (IDR/kg live weight)

RESULT AND DISCUSSION

Profile of Cattle Fattening Samples

The types of fattening cattle that dominate in selected farmer groups are PO, Simpo and Limpo. The average cattle samples condition of the PO, Simpo and Limpo cattle types of each 10 heads, 2-2.5 years old were as follows Table 2.

Table 2. Profile of cattle fattening sample in average (n = 30), year 2016/2017

<table>
<thead>
<tr>
<th>Item</th>
<th>Average</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price of cattle to be fattened (IDR/head)</td>
<td>14,232,333.00</td>
<td>3,240,996.00</td>
</tr>
<tr>
<td>Prices of cattle ready for slaughter (IDR/head)</td>
<td>18,113,333.00</td>
<td>4,186,862.00</td>
</tr>
<tr>
<td>Estimated selling weight (Kg / head) (lambourne formula)</td>
<td>406.32</td>
<td>86.21</td>
</tr>
<tr>
<td>Selling price (IDR / kg live weight)</td>
<td>44,579.00</td>
<td></td>
</tr>
<tr>
<td>Length of fattening (days)</td>
<td>130</td>
<td>32</td>
</tr>
</tbody>
</table>

From Table 2 it can be explained that the average price of beef cattle to be fattened in 2016/2017 is IDR 14,232,333.00 / head and the selling price after fattened for 130 days (4.27 months) is IDR 18,113,333.00 / head. Average estimation of selling weight according to Lambourne formula is 406 kg / head, so the estimated average selling price is IDR 44,579.00 / kg of live weight. Based on the research of Malewa (2009), showed that there is no significant difference in the live weight of livestock based on the Lambourne formula compared with the weight based on the scales in real terms.

Calculation of The Production Cost of Beef

Preparation of production costs is a very important to determine the cost of production or cost of goods sold. In this research the determination of production cost based on full costing method with total cost approach consist of fixed cost and variable cost. The calculation of production cost of cattle fattening that produce beef in the form of live weight as in Table 3.
Table 3. Cost of production/head of cattle fattening / 130 days, in 2016/2017

<table>
<thead>
<tr>
<th>Item</th>
<th>IDR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed cost</td>
<td></td>
</tr>
<tr>
<td>Cash contribution for farmer group*</td>
<td>20,000.00</td>
</tr>
<tr>
<td>Land lease for cattle pen</td>
<td>59,733.33</td>
</tr>
<tr>
<td>Depreciation of cattle pen</td>
<td>159,253.50</td>
</tr>
<tr>
<td>Capital interest (Price of cattle to be fattened, fixed capital and operational capital)(6%/year)</td>
<td>406,371.67</td>
</tr>
<tr>
<td>Total fixed cost</td>
<td>645,358.50</td>
</tr>
<tr>
<td>Variable cost</td>
<td></td>
</tr>
<tr>
<td>Labor**</td>
<td>1,246,910.739</td>
</tr>
<tr>
<td>Concentrat feed</td>
<td>1,189,761.667</td>
</tr>
<tr>
<td>Equipments</td>
<td>85,333.33</td>
</tr>
<tr>
<td>Transport</td>
<td>325,966.6667</td>
</tr>
<tr>
<td>Medicine</td>
<td>33,333.3333</td>
</tr>
<tr>
<td>Total variable cost</td>
<td>2,881,305.74</td>
</tr>
<tr>
<td>Total cost</td>
<td>3,526,664.24</td>
</tr>
<tr>
<td>Cost of beef production (per kg of live weight) ***</td>
<td>40,508.93</td>
</tr>
</tbody>
</table>

Note:
* contribution per sale per cattle
** labor to graze forage and cattle raising
*** Cost of beef production (per kg of live weight), using formula (4)

The result of calculation in table 3 can be shown that the total cost of fattening was IDR 3,526,664.00/head/130 days. Of the various cost components, the cost of medicine is the smallest because the farmers get subsidies from the government in the form of worm medicines and medical assistance from the local animal health posts. Furthermore, the total cost can be used to calculate the cost of beef production, which in this study also referred to as the cost of good sold amounted to IDR 40,509.00 per kg of live weight. When compared to the selling price per kg of live weight of IDR 44,579.00 (Table 2), the farmer gets an excess sale price of 10% of the cost of production (IDR 4,070.00/kg live weight). In determining the selling price of the product, the farmers can be used the cost plus pricing method, where the excess of the selling price to the production cost is a profit for the producer/farmer (Downey & Erickson, 1987).

CONCLUSION

The results of this study can be concluded that for current condition, cattle fattening farming can generate income for farmers. To support the existence of smallholder cattle farming, the government’s policy of setting beef prices should be above IDR 40,508.93 / kg of live weight. The bigger difference between the selling price and the cost of production will improve the welfare of the farmers and is expected to increase of domestic production. Farmers will suffer losses if the price of cattle under market condition drops below of production costs.
REFERENCES


This is to certify that

RINI WIDIATI

has participated as

ORAL PRESENTER

at the 7th International Seminar on Tropical Animal Production
“Contribution of Livestock Production on Food Sovereignty in Tropical Countries”
Faculty of Animal Science Universitas Gadjah Mada, Yogyakarta-Indonesia
September 12 - 14, 2017

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