Improving Smallholder and Industrial Livestock Production for Enhancing Food Security, Environment and Human Welfare

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The 15th AAAP Animal Science Congress
2012 Bangkok Thailand
Improving Smallholder and Industrial Livestock Production for Enhancing Food Security, Environment and Human Welfare

Proceedings Full Papers


The 15th AAAP Animal Science Congress
26-30 November 2012, Thailand
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69/1 Phaya Thai Road, Thung Phaya Thai
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Koonawoottritriron, S., T. Suwanasopee, D. Jattawa, T. Jaichansukkit, K. Boonyanuwat and
P. Skunmun. 2012. Improving Smallholder and Industrial Livestock Production for Enhancing Food
Science Congress held at Thammasat University, Rangsit Campus, Pathum Thani, 26-30 November
2012. AHAT. 3768 p.

Created by
Tropical Animal Genetic Unit (TAGU),
Department of Animal Science, Faculty of Agriculture,
Kasetsart University, Bangkok, Thailand 10900
www.tagu.nisit.ku.ac.th
Scope of AAAP: AAAP is established to devote for the efficient animal production in the Asian-Australasian region through national, regional, international cooperation and academic conferences.


Organization of AAAP:
- President: Recommended by the national society hosting the next biennial AAAP Animal Science Congress and approved by Council meeting and serve 2 years.
- Two Vice Presidents: One represents the present host society and the other represents next host society of the very next AAAP Animal Science Congress.
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Improving Smallholder and Industrial Livestock Production for Enhancing Food Security, Environment and Human Welfare
15 AAAP PRESIDENT’S REPORT

Sawatdee krup!

Greetings to all 15 AAAP attendants:

It’s our great honor and pleasure to welcome you to the 15 AAAP Animal Science Congress, being held during 26-30 November 2012 at the Rangsit campus of Thammasat University, Bangkok, Thailand. The AHAT (Animal Husbandry Association of Thailand under the Royal Patronage of H.R.H. Princess Maha Chakri Sirindhorn), as the official host of the 15 AAAP Congress, has collaborated with the other three significant government agencies as the co-hosts of this Congress, these are the Department of Livestock Development (Ministry of Agriculture and Agricultural Cooperatives), Kasetsart University (KU), and Thammasat University (TU). The Rangsit campus of TU, situated in the northern outskirt of Bangkok, which is under the jurisdiction of Pathum Thani province, is the beautiful venue of this Congress.

The 15 AAAP animal Science Congress programs consist of scientific and technical programs and social and cultural activities. The scientific and technical programs offer 4 enlightening plenary sessions, 9 significant symposia, one-day mid-Congress study tours, and numerous scientific sessions (both oral and poster presentations), as well as other scientific meetings. The most significant symposium is “The Human-Chicken Multi-relationships Based on H.I.H Prince Akishino Research Project under the Royal Patronage of H.R.H. Princess Maha Chakri Sirindhorn”.

It is expected that around 1,200 scientists, livestock producers, development personnel, as well as graduate and undergraduate students from 38 countries will attend 15 AAAP Congress; and more than 700 research papers in all fields of animal production and related fields will be presented and discussed at the Congress. Very interesting and exciting one-day mid-Congress tours on 28 November 2012, consisting 7 alternative routes at your preferred choice, are offered for learning experiences which could be useful for future technical understandings.

The social and cultural programs of the 15 AAAP Congress are as important as the scientific and technical programs since the promotion of friendship and future scientific cooperation are also central to this AAAP Congress. Reception party and opening ceremony will offer selected exciting Thai cultural shows from all regions of the Kingdom. On 28 November 2012, immediately after the mid-Congress tour, the Loy Kratong Festival, a very significant annual festivity of Thailand as being organized by TU, will allow all participants to join this Thai traditional activity, which is full of fun and excitement.

The fantastic farewell party will be offered on the night of 29 November 2012. Participants from each and every country will have a chance to enjoy traditional and cultural exchange in order to strengthen friendship and future cooperation. We do hope that you will not miss this opportunity.
Beside all these colorful programs, spouse programs and other recreational and sports activities are made available for your pleasure at your own convenience.

You can be assured that, in our hospitable Thai way, we will try our best to make your brief visit to our country a very pleasant and memorable one.

Wish you all a very happy and most enjoyable stay in Thailand.

Sawatdee krup,

[Signature]

Chayanon Kittayachaweng
President
Asian-Australasian Association of Animal Production Societies
REMARK FROM CHAIRMAN OF 15th AAAP NOC-TEP

Dear Distinguished Scientists and Ladies and Gentlemen,

It is overwhelmingly heart-felt impressive to receive all attention and high interest from all scientists and friends from all over the world to participate in this important the 15th AAAP Congress being organized in Bangkok, Thailand. This is a good indication of the great concern and interest of the animal scientists to share and learn experiences among each others to help solve the problems in animal production as well as for future research and development collaborations.

You can also agree with me that the Congress is accommodating with high quality of the invited plenary papers, invited lead-papers as well as all short oral and poster presentations. Furthermore, the many Symposia encompassing very important and hot issues dealing with animal production and development are being held by a number of organizations who have been experiencing in the respective fields and by the eminent scientists around the world. It is the great forum for all participants to learn and enrich as well as to interact among one another.

One high-light is to observe the high attendance of the participants especially by the young scientists which is the imperative for them to interact and to link-up for the future research collaborations.

The Congress is not to avail all participants to enrich the high standard of research merits, but also open up the scenario for all to enjoy the social and cultural environment during the Congress. The highly successful and fruitful outcomes of the programs are of concerted efforts contributed by all parts and organizations including from the government, private sector, all participants and with the continuous hard work of the Scientific Committee Members. The special contributions from the Symposia Organizers and their supporters are highly acknowledged and appreciated.

Finally, may I on behalf of the Scientific Committee Members and all associates, wish all the participants to highly achieve the participation expectations and successful in your deliberations as well as to mutually enjoy and interact with all scientist fellows during the Congress.

The great support from all sectors especially from the Congress site host, the Thammasat University, Rangsit Campus, is gratefully acknowledged for their concern, close cooperation and for the available facilities for the Congress.

Special thanks to my Scientific Committee and the Advisory Board Members especially the Vice Chairs and the Secretary of the NOC-TEP of the 15th AAAP Congress are sincerely thankful for their great contribution to make the program the high-caliber one.

Looking forward to meeting all participants in the future Congresses to continue.

With best wishes and warm regards,

Professor Dr. Metha Wanapat
Chairman, National Organizing Committee for Technical Programs (NOC-TEP)
The 15th AAAP Animal Science Congress
PREFACE

This is the full paper volume proceedings of the 15th AAAP Animal Science Congress, which held during 26-30 November 2012 at Thammasat University, Rangsit Campus, Thailand. This volume contains the full paper of 344 oral and 540 poster presentations from various disciplines (i.e., Nutrition and Feed Technology; Breeding and Genetics; Physiology and Health Care; Management, Welfare and Environmental Concern; Education and Extension; Food Science and Technology; and Others) and species (i.e., Swine, Poultry, Cattle, Buffalo, Small Ruminants, and Others) that relate to research done in more than 38 countries.

The Scientific Programs Committee of the National Organizing Committee for Technical Programs (NOC-TEP) is very grateful to all reviewers who kindly gave their valuable time to review a large number of those scientifically interesting abstracts and full papers. We have to thank all volunteers and graduate students of Kasetsart University, who supported and helped in all preparation processes of the current proceedings. There were 1,038 articles submitted for presentation in the Congress. However, we do have limited time and space for presentation programs. We are sorry for the authors that finally their articles could not be accepted within the deadlines. During the preparation process of the proceedings, eventhough we do believe that we had been doing best for all requests related to the articles and presentation, but we do apologize if there are still mistakes. However, it is the authors’ responsibility with the context of the full paper that presented in the 15th AAAP Animal Science Congress and all related proceedings.

Our appreciations go to the 15 AAAP Honorary President (Emeritus Professor Dr. Charan Chantalakhana), the Secretary General (Associate Professor Dr. Supapron Isariyodom), and the Chairman of NOC-TEP (Professor Dr. Metha Wanapat), who suggested and gave us guidances for appropriate preparation of the this full papers proceedings.

Finally, we would like to thank all of the authors for their willing to share their research results and making the Congress valuable, colorful and lively.

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The Performance of Cattle Trade in Indonesia: A Case Study at Ambarketawang Livestock Market in Yogyakarta Province

S. Nurtini, M. A. U. Muzayyanah and T. A. Kusumastuti
Faculty of Animal Science, Gadjah Mada University, Indonesia

The objective of this study is trying to take up a unique social phenomenon in a traditional people community which has hereditary market mechanism system. Smallholder livestock farming was tending to be side-line farming with saving motivation. The study designed on the basis of economic aspect, especially on the rural economic network. The study conducted by document study, interview with key person and the manager of the livestock market. The results of this study showed that the number of the beef cattle transaction was significantly influenced (p<0.01) by the number of livestock coming in the market and the condition of the business of the market ($R^2 = 66.96\%$). Partially, the number of livestock which were coming to the market influenced positively significant (p<0.01) to the number of transaction, as well as the condition of the market. It was descriptively obvious that after stopping of beef cattle import in the middle of 2011, the transaction of cattle was dominated by cows and tends to increase. Transaction in the market reflected the number of beef cattle which would be slaughtered. Further, this condition should be concerning by the policy maker unless there would be running out of beef cattle population.

**Key Words:** Cattle, Cattle trade, Livestock market

**INTRODUCTION**

In Indonesia, the beef cattle farming consist of commercial farming with a various scale of animal business and traditional farming. The commercial farming raise more than 1000 heads of cattle per year consisted of a fattening farming (feeder) a breeding farming (breeder). The fattening farming get commonly young cattle (growing calves) by way of import, and only a small portion of those provided in country. The traditional farming perform fattening of cattle at an animal business scale of 1-5 heads per farmer. It was reported that there were a mode of raising cattle owned by several farmers together in their stables grouped in a certain location (Badan Litbang Pertanian, 2005). Less or more, tradition cattle farming can be described the characteristics of farming system (both cattle and plantation system) in Indonesia. In this case the cattle raised beg the farmer is as much for saving, labor in agribusiness activity, or social status. Since the motivation of raising cattle is as saving, therefore the farmers sell their cattle when they need cash money for the cost of planting time or for their children’s school fee, and they don’t care what kind of the cattle they are selling, whether cows, bulls, calves, or productive cows, as long as they get enough money. Nowadays the greatest contribution of food supply from animal products (meat) in Indonesia is from poultry (56%) and cattle (23%). Demand of beef in Indonesia was fulfilled both from domestic production and imported
products. The average of beef productions in last 19 years in Indonesia increased approximately 4.59 % per year. The highest increase occurred in 2004, reaching 444.6 thousand tons (DGLS, 2009). Many previous studies provide information about condition and productivity of cattle in farmer level, particularly beef cattle in Indonesia. In order to support government in the formulating suitable strategy and policy, this study tried to analyze beef cattle market situation, particularly the beef cattle market transaction, where cattle came from, and its relation.

**MATERIAL AND METHOD**

The study was conducted at Ambarketawang animal market in Yogyakarta, Indonesia. Secondary data on number of cattle and cattle transaction were used in this study from 2007 to 2011 from the monograph of the market collection. Ambarketawang cattle market available only every five days, therefore 365 data recorded during this period (from 2007 to 2011). Multiple regression analysis was applied in this study (Green, 1993). Following formula was used to analyze the determination of cattle number in market and the transaction:

\[ Y = \alpha + \beta X + \delta D + \varepsilon \]

Where, \( Y \) is the number of cattle transaction in the market (head/marketing day), \( X \) is the number of cattle coming to the market (head/marketing day), \( D \) is market condition (Dummy, 1 if in busy period and 0 if otherwise), \( \alpha \), \( \beta \), and \( \delta \) are regression coefficients, \( \varepsilon \) is error term.

**RESULT AND DISCUSSIONS**

Ambarketawang animal market operates every five days that is in Pahing day (Javanese calendar) and called Pahing-market day. Ambarketawang market located in Yogyakarta Province where is densely populated one. The market was built on 3.8 hectares land and can accommodate 300 cattle (small ruminant). There are two important periods of market activities which are:

a. **Busy period.** The increasing of cattle coming in and sold in the market and also the transaction value which commonly take place two weeks before a big day such as Eid al-Fitr (end of Ramadan celebration) up to two months after another big day called Eid al-adha (Islamic cattle-sacrifices celebration) in which it is only approximately of months in a year. In these months, the process of cattle transaction will reach the peak. Approaching the big days, farmers sell their fat cattle and after the big days end, they buy cattle to be fatted and selling it again in the busy period next year. In this moment the price of cattle reach the highest price.

b. **Quiet period.** After reaching the peak, the activity of market return to normal condition, even bending to decrease in the start of the school year, because in this period farmers have to spend their money for their children school-fee.
Table 1 Regression analysis result of beef-cattle market situation

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<th>Variables</th>
<th>Coefficient</th>
<th>P-value</th>
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<tr>
<td>Constanta</td>
<td>-15.8377</td>
<td>0.1506</td>
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<tr>
<td>The number of cattle coming in the market</td>
<td>0.4693*</td>
<td>0.0000</td>
</tr>
<tr>
<td>Market condition</td>
<td>33.2620*</td>
<td>0.0000</td>
</tr>
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$R^2=0.6696$

$F$-statistic=366.8829 (P= 0.0000)

* is significant at the 0.01 level

Multiple-regression analysis among variables was used with enter method analysis gave the best-fitted model. From Table 1, it can be seen that the value of $R^2$ was 0.6696. It was indicated that 66.96% of the variance of the number of cattle transaction performance in the market was influenced by the independent variable observed. $F$-test was used to determine simultaneously the influence of independent variables to the dependent variable. Table 1 showed that value of $F$ was 366.8829 which were highly significant ($P< 0.01$). It was meant that the independent variables have significant effect on the number of cattle transaction performed in the market. To determine the effect of each independent variable on dependent variable, partially, t-test was used to explain this term. The regression coefficient of the number of cattle coming to the market was 0.4693, meaning that 1% increase of the number of cattle coming to the market would increase 0.4693% of the number of cattle transaction performed in the market. Market condition factors showed significantly effect on the number of cattle transaction in the market. It was unsurprising result when the condition of the market was in busy period, the number of cattle transaction in the market would be higher than those of in quiet period. It can be seen in Figure 1 that after stopping of beef cattle import in the middle of 2011, the transaction of cattle was dominated by cows and tends to increase. Transaction occurring in the market was describable of the number of beef cattle would be slaughtered, so that this condition should be the attention of the policy maker unless there would be running out of beef cattle.

**Figure 1** Beef Cattle Transaction by sex in Ambarketawang market (heads)

Source: Monograph of Ambarketawang market
REFERENCES

