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Bogor Agricultural University

3rd AINI INTERNATIONAL SEMINAR

In conjunction to 50th Anniversary Faculty of Animal Science
Andalas University

THE ROLE OF NUTRITION AND FEED IN SUPPORTING SELF SUFFICIENT
IN ANIMAL PRODUCTS, FOOD SAFETY AND HUMAN WELFARE

Padang, 24 – 25 September 2013



PROCEEDING





"The Role of Nutrition and Feed in Supporting Self Sufficient in Animal Products, Food Safety and Human Welfare"

PROCEEDING
3rd International Seminar and 9th Biennial Meeting of AINI
"The Role of Nutrition and Feed in Supporting Self Sufficiency in Animal
Products, Food Safety and Human Welfare"
in conjunction with
the 50th Anniversary of the Faculty of Animal Science
University of Andalas, Padang West Sumatera
Grand Inna Muara Hotel, Padang 24-25 September 2013

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Dr. Ir. Ade Djulardi, MS
Drh. Yuherman, M.S, Ph.D
Ir. H. Fuad madarisa, M.Sc
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"The Role of Nutrition and Feed in Supporting Self Sufficient in Animal Products, Food Safety and Human Welfare"

FOREWARD President AINI

Assalamu 'alaikum Wr. Wb.,
The Honourable Rector of The University of Andalas,
The Dean Faculty of Animal Science, University of Andalas
Distinguish guests, participants, ladies and gentlemen,

First of all, on behalf of the Indonesian Animal Nutritionist and Feed Scientist Association (AINI), I would like to extend our warmest welcome, and indeed it is a great pleasure to see you all in this room, participating in the 3rd International Seminar and 9th Biennial Meeting of AINI in conjunction with the 50th anniversary of the Faculty of Animal Science University of Andalas, Padang West Sumatera. AINI that was firstly established in 1996 with the objective to gather all of the animal nutrition and feed scientists in Indonesia permitting to the exchange of knowledge and experiences under spirit of brotherhood, to stimulate the advancement of science and technology in nutrition and feed science, thus benefiting to the competitiveness of livestock agribusiness.

Since its establishment 1996, AINI has been conducting regularly the biennial scientific meeting. From 2007, the scientific meeting was upgraded to the International level and the first International seminar was conducted at Jenderal Sudirman University, Purwokerto Central Java and then the second International seminar was held in Padjajaran University, Bandung West Java, while this third event is conducting here with the theme **"THE ROLE OF NUTRITION AND FEED IN SUPPORTING SELF SUFFICIENCY IN ANIMAL PRODUCTS, FOOD SAFETY AND HUMAN WELFARE"**

Distinguish guests, participants, ladies and gentleman,

The role of feed and nutrition is primordial in the livestock agribusiness, not only due to the fact that more than 70% of production cost is coming from the feed cost, but also the feed safety that affect the food safety is becoming the great issues in recent years and become a great concern by many countries in the world. Animal products such as egg, meat and milk are subjected to the government policy to reach the self sufficiency. Indonesian government has payed attention and put high priority especially in meat self sufficiency for 2014. Unfortunately, effort made by the government ie. Ministry of Agriculture since many years has facing now the difficulty to succeed, due to some reasons such as the meat price volatility, and also the low exchange rate of rupiah to the US dollar at this time being. Indeed, the demands on the animal products will be increasingly in the future as the population and income per capita are growing. We should take a part and do our best to support the government policy in fullfiling the food of animal products, quantitative and qualitatively. In this regards, role of nutrition and also Nutritionist and Feed Scientist are very important.

I would like also to take this opportunity to share the idea with all you, that AINI as the organization of scientist, to have a international scientific journal is a must. The journal deals with all aspects of nutrition and feed issues in tropical conditions. The Management board of AINI has taken the decision for revitalizing the AINI Journal to become the Journal of Nutrition and Feed Science, internationally recognized, by involving the International committee of lecture as the reviewers. To this end, we need



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fully your support and encourage the scientists especially the young scientists to publish their work in English. The accomplishment of this task will bring the association be more respected in national and international level.

Distinguish guests, participants, ladies and gentleman,

For this opportunity, I should express my sincere thanks to the Dean of the Faculty of Animal Science, University of Andalas, the organizing committee, sponsors, and all party that cannot be listed since we are deeply in debt to all of your effort and sacrifice to the success of this seminar. Our sincere thanks must go to the Directorate General for Higher Education Department of National Education for the grant awarded. For our invited speakers, Prof. Tamo Fukamizo (Kinki University, Japan), Dr. Robert L. Payne (Evonik-US), Dr. Yuwares Ruangpanit (Thailand), Prof. Abdul Razak Alimon (UPM Malaysia), Prof. Yose Rizal (University of Andalas, Indonesia), Prof. Ali Agus (University of Gajah Mada, Indonesia), Prof. Suhubdy (Mataram University, NTB) we are indebt to your effort and your participation in this event. Your views will enlighten and inspire how to empower our local feed resources in sustaining the feed security for the future. Also, on behalf of the AINI, I must express my deepest gratitude to the Director General of Livestock Services Department of Agriculture for his willingness to give the key note speech to this seminar.

Distinguish guests, participants, ladies and gentleman,

I hope you will have the fruitful meeting and gaining many new ideas and perspectives to be developed in the future. I do hope also, we will see you again in the 4th International seminar and Xth Biannual meeting 2015 that will be hosted by AINI member and colleagues from Sam Ratulangi University, Manado, North Sulawesi as the organizing committee.

Finally and surely, please enjoy your stay with west Sumatera culture and nature, tradition and hospitality, in addition to your scientific activities. Thank you,

Wassalamu 'alaikum Wr. Wb.

Padang, September 24th, 2013

President AINI

Prof. Ali Agus

Bogor Agricultural University



"The Role of Nutrition and Feed in Supporting Self Sufficient in Animal Products, Food Safety and Human Welfare"

FOREWORD ORGANIZING COMMITTEE

Assalamu 'alaikum Wr. Wb.,

The Honourable Rector of The University of Andalas,
The Dean Faculty of Animal Science, University of Andalas

Distinguish Guests, Seminar Participants, Ladies And Gentlemen,

First of all, we are very grateful for Allah the Almighty, who has allowed us to get together in the prestigious 3rd AINI International Seminar which is held by the Faculty of Animal Science, University of Andalas in conjunction to celebrate the 50th Anniversary of the Faculty of Animal Science, collaborated with Indonesian Association of Nutritionist and Feed Scientist (AINI). We would like to welcome all participants who have come from different provinces in Indonesia, and especially to our distinguished guests and participant from overseas (USA, Japan, Thailand, Malaysia, Philippine and Australia).

The animal protein consumption of the people in Indonesia and other developing countries around the world as well is still low. The Indonesian Government has performed many efforts to increase this animal protein consumption. One of them is through the launching of a program called the self sufficient in beef (program swasembada daging sapi = PSDS), that has been targeted to be achieved in 2014. Besides, other attempts are also to develop poultry and other animal industries that have contributed to the fulfillment of animal protein requirement. However, based on the animal industry condition nowadays it would be rather complicated to achieve it, due to the low in farm animal productivity in Indonesia. Among the problems of low in animal productivity are the nutrition and feed they obtain during their life cycles. Besides, the price of feed for animal industries could reach 60 to 70% of the total cost of animal production. Indonesia has very limited range land for cattle grazing and limited feed sources for poultry feeding. The cattle feeding are very dependent on the utilization of agriculture waste/by-product as the source of feed. Most of these available feedstuffs are low in quality, so that they require further processing before feeding them to cattle. Meanwhile, the poultry and other farm animal feeding are depending on imported feeds. The other problem is the concern in utilization of in-organic feedstuffs or feed additives for growing farm animals.

The theme of this seminar is very relevance to the nowadays national as well as international issues of feeding safety feed for livestock and poultry, and conserving nutritious, safety and hygienic food for human health. This nutritious, safety, hygienic and healthy food of animal origin will be obtained from the high quality of feed that is fed to animals. The feed and food processing technology will support the high quality of feed and food. This 3rd AINI International Seminar on nutrition and feed is held to collect the information and to share the ideas from nutritionists, scientist and practitioners on the nutrition, feed processing technology and its utilization for producing high quality of feed and food which are available in other part of the world to contribute to the human welfare.

Prof. Dr. Novirman Jamarun

Chairman of the Organizing Committee

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WELCOME SPEECH

Rector of Andalas University

Bismillahirrahmaanirrahim,

Assalamu'alaikum wrwb, Peace be with you!

Your Excellency, Governor of West Sumatra Province.

Your Excellency, Chairman of House of Representative of West Sumatra Province

The Honorable, Dr. Mursyid Ma'sum, M.Agr, Director of Animal Feed, Direktorat General of Livestock and Animal Health, Ministry of Agriculture.

The honorable, The Chairman of Indonesian Association of Nutritionist and Feed Scientist (AINI), Prof. Dr. Ali Agus DAA, DEA, from Gajah Mada University.

Honorable guest, the Dean of The Faculty of Animal Science.

The Honorable guests all keynote speaker.

Seminar Committees, Participants, Ladies and Gentlemen,

Good evening.

First of all, let us say a merciful for Allah the Almighty who has given us a chance to meet each other at this 3rd AINI International Seminar which is held by the Faculty of Animal Science University of Andalas in conjunction to celebrate of 50th Anniversary Faculty of Animal Science, Andalas University.

On this occasion, I welcome all of the seminar participants who come from different places in the world, as well as participants from different uiversities and agencies in Indonesia.

On this opportunity, I would like to introduce to all of you about the University of Andalas. It was the oldest university in Indonesia, outside the Java Island that was founded in 1956. This university has 15 Faculties with 38 study programs for Sarjana degree, and 34 Graduate Study Programs for Master's and Doctor's degrees. The Faculty of Animal Science is one of the faculties at the University of Andalas which was established in 1963. I am very proud of this International seminar, which is conducted by the Faculty of Animal Science.

It indicates that the Faculty of Animal Science, University of Andalas, has the capability to create a link or a network with national as well as international level institutions, in which it is a kind of initiation toward the world class university.

Ladies and Gentlemen,

From this 3rd AINI International Seminar, I hope that it will result in the fruitful thoughts and brilliant ideas which could be implemented by the government and animal industrial community for the development of the Animal Feed industries in Indonesia as well as in West Sumatra. The Faculty of Animal Science University of Andalas plays a role in the development of feed industries in cooperation with the government, and livestock as well as animal nutritionist organizations.

Feed Industries contribute to the fulfillment of animal development in Indonesia because Feed is one most important factors to develop animal production and animal population and with cheap in price of feed will give high benefit could be reached by the



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farmer. The development of feed and animal industries needs science and technology, and through this seminar, it is hoped that the scientists from all over the world could contribute the information and technology in disciplines in feed sciences.

Ladies and Gentlemen,

This seminar is in concomitant with the 57 year University of Andalas, and the 50 year Faculty of Animal Science Anniversaries. Considering the age of this institution, it is the appropriate time for this institution to play its role at the international level. The progress toward the world class university is a dream of every institution, including the University of Andalas. That is why I hope that this international seminar could be performed routinely, so that the development of science and technology in the field animal science could always be monitored and implemented by the animal community in Indonesia.

Finally, I would like to address my special thanks to the committees who have work very hard to prepare this seminar, congratulation and good luck for all of you.

Wassalamualaikum wr.wb.

Dr. Werry Darta Taifur, SE, MA
Rector of Andalas University



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WELCOME SPEECH

Governor of West Sumatera

Assalamualaikum. ww

Your Excellency, Chairman of House of Representative of West Sumatera Province. Ir. Yulteknil, MM

The Honorable, Dr. Mursyid Ma'sum, M.Agr, Director of Animal Feed, Direktorat General of Livestock and Animal Health, Ministry of Agriculture.

The honorable, Prof. Dr. Ali Agus DAA, DEA, The Chairman of Indonesian Association of Nutritionist and Feed Scientist (AINI) from Gajah Mada University.

Honorable guest, the Rector of the University of Andalas.

The Honorable guests all keynote speaker.

Honorable guest, the Dean of The Faculty of Animal Science.

Seminar Committees, Participants, Ladies and Gentlemen,

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First of all we are very grateful for Allah the Almighty, who has allowed us to get together in the prestigious 3rd AINI International Seminar which is held by the Faculty of Animal Science University of Andalas in conjunction to celebrate of 50th Anniversary, Faculty of Animal Science, Andalas University.

I would like to say 'welcome' to all of participants who have come from different areas in Indonesia, and especially to the participants from several countries (USA, Malaysia, Thailand, USA and Japan).

West Sumatra is one of 33 provinces in Indonesia which is also called "Ranah Minang" or Minang Area, because this area mostly inhabited by Minangkabau ethnic. This province is well known with its beautiful scenery and culture, because it possess Sianok canyon, marvelous beach in Mentawai Island with its high wave that is suitable for surfing, gorgeous Harau Valley, four beautiful lakes (Singkarak, Maninjau, Upper and Lower Lakes), and several other places for tourism. We have two international regular events, the first is Tour de Singkarak, and the second is Padang International Dragon Boat competition. Tour de Singkarak, a bike racing event every year followed by many bicyclers from all over the world, got its name from this lake's name 'Singkarak'.

The population of West Sumatra province is approximately 4 million people who mostly are moslems. Besides, Ranah Minang also well known with its specific hot and spicy foods. One of the menus is RENDANG, which is the most delicious food in the world. Rendang is made of varieties of meat (beef, chicken, or egg) which is mixed up with coconut milk, chili, and other ingredients. That is why, after this seminar I suggest you to spare your time visiting some of those beautiful and marvelous places while enjoying the specific menu I mentioned.

Furthermore, I would like to address that this 3rd AINi International Seminar is an important event for us, because it is a place where the experts from all over the world get together, informing their research findings to the others and sharing the ideas in order these findings and ideas to be useful for the development of science and technology in animal nutrition. The information from this seminar will be very useful for the development of animal industry in West Sumatra, Indonesia as well as in other countries around the world.



"The Role of Nutrition and Feed in Supporting Self Sufficient in Animal Products, Food Safety and Human Welfare"

Ladies and Gentlemen,

The target of the Indonesian Government nowadays is to achieve the self-sufficient in meat in 2014 in order to fulfill the demand for animal protein for the Indonesian people. For supporting the achievement of this target, the West Sumatra province is implementing a program called "Satu Petani Satu Sapi" or one farmer one cow which is funded by government and private. The purposes of this program are to motivate farmers to raise cattle, to accelerate the increase in the population of cattle, to accelerate the achievement of target in fulfilling the demand for animal protein, to vary the source of income for farmers, and to increase the farmers' income.

Ladies and Gentlemen,

Finally, I hope this seminar will produce the fruitful thoughts which could be implemented in the development of animal industry around the world as well as in Indonesia. Please enjoy this seminar, congratulation to the 50th Anniversary Faculty of Animal Science, University of Andalas, and I wish it will be continued with the other international seminars in different field.. Good luck for you all!!! And by saying:

Bismillahirrahmaanirrahim, I officially open this seminar.

Wabillahitaufik walhidayah, Wassalamualaikum warahmatullahi wabarakaatuh.

Governor of West Sumatera Province

Prof. Dr. Irwan Prayitno, PSi, MSc

Bogor Agricultural University

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P-21	Effect Of Vitamin E Supplementation In The Extender On Frozen – Thawed Semen Preservation Of Pesisir Cattle <i>Zaituni Udin; Ferdinal Rhim; Jaswandi and Ayu Fadillah</i>
P-22	Green livestock development: the role of lactic bacteria for improvement and utilisation Of total mixture forage <i>Zaenal Bachruddin¹, Supadmo¹, Lies Mira Yusiaty¹, Chusnul Hanim¹, Asih Kurniawati¹, Dimas Hand Vidya Paradhipta² and Mayansari²</i>
P-23	The effects of roasted coriander seeds in the diet on carcass trait and cholesterol content of broiler <i>R.Mutia, R.G. Paminda, and N.Ramli</i>
17:30 – 18:00	CLOSING CEREMONY AT OMBILIN 2-3
19:00 – 22:00	FAREWELL DINNER AT MAJOR HOUSE OF PADANG CITY

INVITED SPEAKERS

Invited Speakers at 3rd AINI International Seminar, Padang, West Sumatera, Indonesia



Dr. Mursyid Ma'sum, M.Agr

Director of Animal Feed, Directorate General of Livestock and Animal, Health Services.

Prof Dr. Tamo Fukamizo (Kinki University Japan)

graduated his Bachelor and Master course of Agricultural Chemistry of Kyushu University, Japan, in 1977 and 1980, respectively. He completed his Ph.D. in Kyushu University in 1983. Currently, he is a full professor of Enzyme Chemistry at Department of Advanced Bioscience, Kinki University, Japan. His research of interest is,

1. Crystal structure analysis of the chitinase-oligosaccharide complex
 2. NMR analysis of the interaction of chitin-binding proteins
 3. Calorimetric analysis of the interaction of chitin-binding proteins
 4. Conversion of chitinase into a glycosynthase by protein engineering technique
 5. Biomass conversion from fungal cell wall by enzymatic digestion
- Recently, in collaboration with Dr. Maria Mahata, University of Andalas, he successfully produced partially N-acetylated chitooligosaccharides, which might be used as animal food ingredients, directly from fungal cell wall. In today's his lecture, mechanism of oligosaccharide production from chitin and chitosan biomass will be presented, and the utilization of the products will be discussed.



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Dr. Robert L. Payne, Ph D, PAS (Evonik - US)

Regional Director of Nutrition and Technical Services for Evonik Health & Nutrition. Rob joined Evonik-Degussa in 2004, and since that time, he has served Evonik's Health and Nutrition group as Animal Nutrition Services Manager, Technical Services Manager for US and Canada, and Director of Nutrition and Technical Services for North America. In 2011, Rob moved to Singapore to become Director of Nutrition and Technical Services for the Asia South region. As technical director, Rob is responsible for guiding Evonik's value-added technical services team, which provide tools and consulting for nutritional, analytical, and feed production issues. Rob has authored numerous peer-reviewed, popular press articles, and invited talks, and currently serves on the editorial boards for the Journal of Animal Science and Poultry Science.



Prof. Dr. Ali Agus, DAA, DEA (University of Gajah Mada, Indonesia)

Graduated from the Faculty of Animal Science, University of Gajah Mada in 1989, and completed his DAA, DEA (1993) and Doctorate (1996) from Ecole Nationale Supérieure Agronomique de Rennes (ENSA), Rennes, France in Nutrition and Physiology of Dairy Cattle. He is also a member of National Feed Commission, Department of Agriculture, Republic of Indonesia. He published several books and articles in peer reviewed international journals, presented papers in international meeting and published in Proceedings. His research interest are in animal nutrition, feed toxicology, mycotoxins and community developments.



Dr. Yuwares Ruangpanit (Thailand)

graduated her Bachelor and Master in Animal Science from Kasetsart University, Thailand in 1992 and 1995, respectively. She completed her Ph.D. in Nutrition from North Carolina State University in 2004. Currently, she is a lecture of Mono-gastric animal nutrition at Department of Animal Science, Kasetsart University, Thailand. Her research of interest is nutritional evaluation and application of alternative energy and protein source for poultry, especially, a high fiber by-product from Agro-industry. Her responsible research also involves in the application of feed additive in mono-gastric animal under tropical conditions



Prof. Dr. Abdul Razak Alimon (Malaysia)

obtained his Bachelor of Science and Masters of Science in Agriculture from the Faculty of Rural Science, University of New England, NSW, Australia in 1971 and 1980, respectively, and completed his Ph.D degree in 1989 at University of Reading, United Kingdom. He is currently a Professor of Animal Nutrition at the Department of Animal Science, Faculty of Agriculture, Universiti Putra Malaysia. His current interest is in the utilization of herbs as growth promotants in poultry and also agricultural byproducts as animal feed.

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"The Role of Nutrition and Feed in Supporting Self Sufficient in Animal Products, Food Safety and Human Welfare"



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P-02. INTEGRATED FARMING SYSTEM WITH EMPOWERMENT OF CATTLE FARMERS GROUP IN VILLAGE KINOMALIGAN

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Abstract

Farmer groups in villages such Kinomaligan cattle farmer groups Bulawan Jaya with the main program is farming rice and corn. In 2007, the group received help cattle by the government. The issue of land owned by the land has not been used as a forage planting fodder. Cattle still consume agricultural waste and low quality grass field. Based on these problems has been done for the IbM activities to empower members of the group. Empowerment has been done to increase revenue so that the welfare of the group members and their families increased. Cattle farming in the village Kinomaligan in general is still cultivated extensively. Cattle removed only in groups, grazing farms. This causes low productivity of cattle. The application of science and technology through IbM's cattle farmers group Bulawan Jaya I and Bulawan Jaya II have been successful. The products produced in the form of the land area of 0.3 ha planted with grass quality (dwarf), silage, amoniasi of rice straw and maize straw, compost and biogas. The advice given is necessary accompaniment by the universities to members of the group can be independent. If the application of science and technology can be carried out by members of the group continue the concept of integrated farming system can be implemented to the maximum.

Keywords: Empowerment, group, cattle

INTRODUCTION

Bolaang Mongondow is one of the districts in the province of North Sulawesi with a population of 223 485 inhabitants, has an area of 3506.24 km² which is divided into 12 districts and 152 villages (PEMDA Bolaang Mongondow, 2011). The agricultural sector is a source of livelihood Bolaang Mongondow society. Contributed by agriculture, plantation, animal husbandry, forestry and fishery of 52.08% at current prices.

Bolaang Mongondow as a food basis for the North Sulawesi province. It can be seen from some potential commodities that can be developed in an attempt to support the potential for increased food security in the province of North Sulawesi, which is illustrated by the achievements of commodity production. One of the favored commodity is rice.

Districts Dumoga West is one of the districts in Bolaang Mongondow potential for cattle development (Elly, 2008). In the District of West Dumoga (including Kinomaligan village) there are several farmer groups. Formation of the group is a government program based on joint decision of the Minister of Interior and Minister of Agriculture, No. 54 of 1996 and No. 304/KPTS/LP120/4/96, on Guidelines for the Implementation of Agricultural Extension. The program is expected to develop farmer groups in accordance with local conditions and potential resources, and considering strategic environment that influence Department of Animal Husbandry, 1998).

In the village of Kinomaligan have formed farmer groups, ie groups of cattle farmers Bulawan Jaya who were divided into 2 groups on the initiative of



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members of the group and Team Faculty of Animal Husbandry Department of Social Economics UNSRAT. Group of Bulawan Jaya was originally formed in 2004 with the main program is paddy and maize fields. The group was formed at the initiative of 13 people and in 2005 by 10 members so that the number of members to 33 people. In 2006 the group "Bulawan Jaya" gets a flood that damage crops residents. Group nearly broke up because not bound by the rules are written. In 2007 the group became active again. Now the cattle belonging to the group "Bulawan Jaya" totaled 32 head and has obtained donations of some 18 heads of cattle. Managed land area of 15 hectares.

The issue of available land has not been used as a land for cattle development. Problems faced by cattle farmers is cattle business management is not as it should be. Cattle still consume agricultural waste and low quality grass field. This causes low productivity of cattle. To increase production and productivity of cattle depending on the feed consumed. Members of both groups have not been able to utilize the available land for planting forage quality. Dry land belonging to the group can be integrated with planted forage crops.

Based on the above reasoning and problem then formulated the following priority issues: (i) lack of knowledge of the group concerning quality feed and are available continuously, thus needs to introduction of cattle food quality. (ii) lack knowledge of the group on the use of rice straw and corn and forage preservation. (iii) lack of knowledge of the group members use cattle manure as fertilizer and biogas.

MATERIALS AND METHODS

The application of science and technology have been made since July to October 2012 at the cattle farming group Bulawan Jaya in Kinomaligan village of West Dumoga District. Application of science and technology that have been made in the form of empowerment for members of the group by using two methods: extension and training methods.

Extension for members of the group "BULAWAN JAYA" with the aim of changing the behavior of resource group members toward better (Pambudy, 1999). Some of the philosophy of extension is: (1) extension program relying on farmers' needs, (2) extension is basically the process of education for adults who are in formal. The goal is to teach farmers, improve their lives by his own efforts, as well as teaching farmers to use natural resources wisely, and (3) extension in collaboration with other organizations to develop individuals, groups and nations. Material presented is concerning cattle business management, the benefits of compost and biogas benefits. Having conducted illumination to members of the group, further training for the member of the cattle farmer group "BULAWAN JAYA". Training is a practical application of the technology is the introduction of a dwarf grass, silage making, manufacture of ammoniation, composting and biogas production.

RESULTS AND DISCUSSION

Cattle farming is one of the mainstay of rural households in improving their welfare. Cattle are genetic potential and has a high adaptability to the tropical environment. Cattle have a role to food sources (meat), as savings, sources of income, sources of labor, organic fertilizer sources and alternative energy sources (Elly, 2008., Elly et al, 2008).



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Cattle maintenance considerations by looking at its role in society in general increased revenue and earnings cattle farmer groups "Bulawan Jaya" in the village Kinomaligan in particular. Characteristics of the groups showed that 100% of the members were farmers.

Age group members influence the production process cattle farming. Age group members ranged from 30-52 years. The average age for members of the group "Bulawan Jaya I" is 42.36 years. The average age of members of the group "Bulawan Jaya II" 39,20 years. This condition indicates that the age of the group members still in the productive age. The indication that the group members are more productive in applying science and technology is being introduced. This is apparent at the extension that has been done over at 20.00 pm, was attended by members of the group to finish. According Kiswanto et al (2004), the higher the age of the farmer, to a certain extent, the ability to work will increase thus increasing productivity.

The level of education also affects the acceptance of the application of science and technology group members. Educational level of the lowest member of the group is the primary school level. Highest level of education is high school level. Education level group members "Bulawan Jaya I" for elementary schools and high schools each ranging from 27.27%, junior high school level is of the largest ranges 45.46%. Education level group members "Bulawan Jaya II" for elementary schools and high schools each ranging from 10.0%, junior high school level is the largest around 80%. This condition shows that the education level is still considered low for both members of the group. The indication in the training of some members of the group are inactive. This is supported by Kiswanto et al (2004) that the higher the level of formal education of farmers, the more rational mindset and the power of reason.

Number of cattle owned by members of the group at the time of application of science and technology as much as 62 tails. 28 tail belongs to member "Bulawan Jaya I" and 34 tails belong to members of "Bulawan Jaya II". Cattle belonging to the group are managed individually. This is as reported Fagi et al (2004) that in general members of the group of beef cattle farmers "Karang Endah" in Central Lampung managing individual cattle.

Cattle farming in the village Kinomaligan generally still cultivated extensively. This condition as proposed Bamualim et al (2004) that cattle generally maintained extensively. Cattle removed only in groups, grazing pastures, in rainfed areas and in other open land. Members of the group "Bulawan Jaya" also maintain the grazing cattle farms. This causes low productivity of cattle.

Feed is one of the critical elements of a successful cattle farming (Elly, 2008). Kardiyanto (2009) argues that in livestock farming, livestock require food substances that contain protein and energy. The low productivity of cattle belonging to members of the group caused by the feed consumed just a field of grass and agricultural waste. Based on this, it has made the introduction of forage, the dwarf grass. This introduction is very response by members of the group due to meet the feed requirements of cattle moved from one land to another farm. Planting grass on land owned by members of the group covering 0.3 ha. Type of grass that is planted dwarf grass (*Pennisetum purpureum* cv Mott). This grass quality is better than grass or king grass.

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Members of the group had been trained to preserve the grass, in the form of silage. The application of science and technology to anticipate when the grass is planted there is over production. Silage processed with utilizing local resources. Ingredients such as fresh grass (derived from BPTP Kalasey) and rice bran. Harvest fresh grass cut 2-5 cm, then put in an airtight plastic bag. Every 15 cm of fresh grass sprinkled with rice bran. Then, the grass filled up solid and firmly closed (tied plastic bag). The process for 21 days and after it opened to smell fragrant and slightly sour. It is also addressed by members of the group.

The main farming developed by members of the group are rice and corn. It is a show that wastes enough rice available but not utilized by the group members. According Djayanegara and Ismail (2004), the use of agricultural waste to feed to reduce reliance on land to feed, and the funding needs time to mengarit grass for closure. Based on this phenomenon, the waste rice and corn waste has been used as ammoniation. Members of the group have been trained to make ammoniation of rice straw and corn straw.

The process of making rice straw ammoniation dry (water content of about 60%) was cut into pieces 2-5 cm. Straw that has been cut into pieces stacked in a plastic bag, and then trampled to solid. Then the straw is stacked in a plastic bag sprinkled with probiotics (SB) and urea in the ratio of each 6 kg for every ton of rice straw. To develop probiotic then sprinkled water to 60% the moisture, which is indicated by the hand-wringing that has straw. When seen, the water in the palm of the hand as if it's about to drip. That is, the water will be enough. Method was repeated again with a pile of 15 cm to a plastic bag full. After a closed plastic bag and left tied up for 21 days in a protected area of rain and direct sunlight. After 21 days, fermented ready to be given to the cattle. The same process has been done for corn straw ammoniation.

Members of the group have been trained to utilize cattle feces as compost. The results showed that cattle manure is left scattered on farms. This can cause pollution if left lying cattle manure on farms and even in the streets of the garden. Cow manure that is left can lead to increased greenhouse gas emissions. To prevent the increase in the cattle manure compost is made.

Compost is an organic fertilizer derived from crop residues and cattle dung that has undergone a process of decomposition or weathering. Benefits of compost to improve soil fertility is owned by members of the group. According Salendu (2012), in the production process that integrates all existing waste utilized the principle of zero waste. In this case, there is no waste remains, the waste can be processed to generate income for farmers and their families. Composting has done is above the soil surface were originally made of container and bamboo beams measuring 150 x 100 x 90 cm.

Composting procedure is rice straw was dried stacked in the container. The number of rice straw as high as 15 cm in the container provided, then put the dried cattle feces while being trampled so solid. Then sown EM4 (starter bacteria) that has been mixed with water and sugar. So forth step is repeated until the container is full. Once the container is full, open beams and bamboo, then a pile of straw and cattle feces covered with a tarp and tied. A week later screened compost and reversal process is done every week for 4 weeks.

Group members are also trained utilizing waste of cattle as biogas. Biogas production has been done with the aim of preventing environmental pollution



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resulting from cattle feces. In addition, the price of kerosene is expensive and increasingly scarce, requiring the development and deployment of non-fuel energy technologies that are environmentally friendly (Elly, 2012). Furthermore, according to Elly (2012), the policy is primarily intended for rural households whose incomes are relatively low. One of the energy technologies that comply with these requirements is biogas technology. Fuel biogas from cow manure can substitute kerosene increasingly expensive and scarce.

Biogas is a renewable energy source that can address the need for energy, as well as can provide soil nutrient needs in a sustainable agricultural system. Utilization of cattle waste into biogas to support the application of the concept of zero waste to sustainable agriculture and eco-friendly can be achieved. Grisertpol et al (2010) suggested that biogas is a type of energy and sustainable development that are essential to energy and environmental planning.

Elly (2012) suggested that cattle waste produces methane gas (CH₄) is increasing greenhouse gas emissions (GHG). According to Masse et al (2003), methane is one of the greenhouse gases accumulate in the atmosphere due to human activities. This is why farms claimed to cause global warming.

Biogas production procedure by following these steps. The first member of the group set up a biogas reactor made of drums, which are designed in such a way as to accommodate the cattle feces. Two other drums are provided for the gas reservoir. Then the cattle manure mixed with water, a ratio of 1: 1, stirring until dissolved then inserted into biogas reactor. A large drum with a capacity of 200 liters is supplied to the gas container filled with water, the drum controller function as gas formation. Then, a small drum with a capacity of 120 liters filled into a large drum that had been filled with water. Four weeks later the gas was formed, the small drum will be lifted. Then the stove ignited and produces heat which is used for cooking. The more a mixture of cattle dung, it means a capacity greater biogas reactor will produce a bigger fire, hotter and longer used for cooking.

CONCLUSION

The application of science and technology through IBM in cattle farmer groups "Bulawan Jaya I" and "Bulawan Jaya II" has been successful. The products produced in the form of the land area of 0.3 hectares planted quality grass (dwarf), silage, ammoniation of rice straw and maize straw, compost and biogas. Suggestions submitted are necessary guidance by the College to members of the group can be independent. If the application of science and technology can be carried out by members of the group kontinyu the concept of integrated farming system can be implemented to the maximum.

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