

ISBN 978-602-96530-3-8



# Proceeding

## The 2<sup>nd</sup> Asian-Australasian Dairy Goat Conference

April 25-27<sup>th</sup>, 2014

IPB International Convention Centre Bogor, Indonesia

**THE ROLE OF DAIRY GOAT INDUSTRY IN FOOD SECURITY,  
SUSTAINABLE AGRICULTURE PRODUCTION,  
AND ECONOMIC COMMUNITIES**



**AADGN**

Organized by:

**Faculty of Animal Science,  
Bogor Agricultural University**

Supported by:



**Napindo**



**INDONESIA**

FEED



Melayani Dengan Setulus Hati



**LIST OF EDITORS**

- Editors:**
- Prof. Dr. Ir. Komang G. Wiryawan (Indonesia)
  - Dr. J. B. Liang (Malaysia)
  - Dr. C. Devendra (Malaysia)
  - Prof. J. Takahashi (Japan)
  - Dr. E. R. Orskov (UK)
  - Prof. Dr. Ir. Dewi Apri Astuti, MS (Indonesia)
  - Prof. Dr. Ir. Wasmen Manalu (Indonesia)
  - Dr. Anuraga Jayanegara, SPt. (Indonesia)
  - Ir. Anita S. Tjakradidjaja, MRur.Sc. (Indonesia)
  - Dr. Sri Suharti, SPt, MSi. (Indonesia)
  - Dr. Irma Isnafia Arief, SPt, MSi. (Indonesia)
  - Dr. Ir. Dwierra Evvyernie, MSc. (Indonesia)
- Reviewers:**
- Prof. Dr. Ir. Komang G. Wiryawan (Indonesia)
  - Dr. J. B. Liang (Malaysia)
  - Dr. C. Devendra (Malaysia)
  - Prof. J. Takahashi (Japan)
  - Dr. E. R. Orskov (UK)
  - Prof. Dr. Ir. Dewi Apri Astuti, MS (Indonesia)
  - Prof. Dr. Ir. Wasmen Manalu (Indonesia)
  - Dr. Anuraga Jayanegara, SPt. (Indonesia)
  - Ir. Anita S. Tjakradidjaja, MRur.Sc. (Indonesia)
  - Dr. Sri Suharti, SPt, MSi. (Indonesia)
  - Dr. Irma Isnafia Arief, SPt, MSi. (Indonesia)
  - Dr. Ir. Dwierra Evvyernie, MSc. (Indonesia)
  - Prof. Dr. Ir. Toto Toharmat, MSc. (Indonesia)
  - Prof. Dr. Ir. Cece Sumantri, MAgr.Sc. (Indonesia)
  - Dr. Epi Taufik SPt, MVPH, MSi. (Indonesia)
  - Dr. Ir. Asep Sudarman, MRur.Sc. (Indonesia)
  - Dr. agr. Asep Gunawan, SPt, MSc. (Indonesia)
  - Prof. Dr. Ir. Panca Dewi MHK, MS. (Indonesia)
  - Ir. Lucia Cyrilla E. N. S. D., MSi. (Indonesia)
  - Dr. Jakaria, SPt, MSi. (Indonesia)
  - Dr. Ir. Afton Atabany, MSi. (Indonesia)
  - Dr. Ir. Lilis Khotijah, MSi. (Indonesia)
  - Prof. Dr. Erika B Laconi, MS. (Indonesia)
- Layout Editor:** Irma Nuranthy Purnama, S.Pt., MSi.

# TABLE OF CONTENTS

---

<b>List of Editors</b>	<b>ii</b>
<b>Table of Contents</b>	<b>iii</b>
<b>Foreword from Chairperson of Organizing Committee</b>	<b>x</b>
<b>Foreword from President of Asian-Australasian Dairy Goat Network (AADGN)</b>	<b>xii</b>
<b>Remarks from Rector of Bogor Agricultural University</b>	<b>xiii</b>
<b>Keynote Speaker</b>	
Government Policy on Dairy Goat Development in Indonesia. <i>Syukur Iwantoro</i> ...	3
Dairy Goat Production on Smallholder Agriculture in Indonesia. <i>I-Ketut Sutama</i> ..	8
<b>Invited Speaker</b>	
Gender Equity in Sustainable Animal-agriculture: Enhancing Empowerment and The Contribution of Women for Improved Livelihoods, Stable Households and Rural Growth. <i>C. Devendra</i> .....	21
Enhanced Goat Production from Leucaena - New insights into the Role of Anti-nutritive Factors. <i>C. S. McSweeney, Padmanabha, J. N. T., Halliday, H. M. Shelton</i> .....	31
Dairy Goat Milk and Composition in So-called Developing Countries. <i>Egil R. Ørskov, Kustantinah A</i> .....	37
Perspective of Methane Production by Dairy Goat Farm. <i>J. Takahashi</i> .....	39
Breeding Programme for Dairy Goats in India. <i>Aranganoor K. Thiruvankadan, Ramanujam Rajendran</i> .....	42
Dairy Goat Production in Thailand. <i>Sansak Nakavisut, Suwit Anothaisinthawee</i> ...	45
Dairy Goat in Malaysia. <i>Shanmugavelu Sithambaram, Quaza Nizamuddin Hassan Nizam</i> .....	49
Goats in Japan— the Past, the Present and the Future. <i>Shinichi Kobayashi</i> .....	53
Dairy Goat Production in the Philippines. <i>Cesar C. Sevilla</i> .....	57
A Study of Fresh Water Hyacinth Levels ( <i>Eichhornia crassipes L.</i> ) in Diets on Nutrient Intake and Digestibility, Nitrogen Retention and Rumen Environment of Bach Thao Goats in the Mekong Delta of Vietnam. <i>Nguyen Van Thu, Nguyen Thi Kim Dong</i> .....	61
Dairy Goat Production in Iran. <i>Seyed Mehdi Hoseini</i> .....	65
Housing Advancements in Dairy Goat Farming for Smallholders in the Tropics, Part II. <i>N. Yogendran</i> .....	69

Present of Status Dairy Goat in Pakistan. <i>M. Fatah Ullah Khan, Faisal Ashfaq, Abdul Ghaffar</i> .....	72
Herbs, Minerals and Fermented Feed for Dairy Goats in Indonesia. <i>Toto Toharmat, Dewi Apri Astuti</i> .....	77
Bangun Karso's Dairy Goat Farming Practices in Bogor-Indonesia. <i>Kusuma Diwyanto</i> .....	86

## **Oral Presentation**

### **Breeding and Genetics**

Role of MHC Genes as Useful Biomarkers in Dairy Beetal Goat Breed of Pakistan. <i>Atiya Yasmeeen, Tanveer Hussain, Tahir Yaqub, Abdul Wajid, Ali Ahmad Sheikh, Masroor Ellahi Babar</i> .....	96
Early Selection Technology for Growth in Etawah Grade Goat. <i>S. Maylinda, Kuswati, T. Susilawati, Suyadi, A. Rachmawati</i> .....	99
Evaluation on Growth Rate of Anglo Nubian, Etawah Grade, and Anglo Nubian X Etawah Grade Kids. <i>Lisa Praharani</i> .....	102
Technology of Marker $\alpha 1$ -Casein Gene for Selection Method in Etawah Grade Goats. <i>T. E. Susilorini, S. Maylinda</i> .....	105
Estimates of Genetic and Phenotypic Trend for Growth Traits in Etawah Grade Goat. <i>F. Hasan, Jakaria, A. Gunawan</i> .....	108
Comparison of Detection Methods of Sperm Acrosome in a Cold Shock Model of Caprine Semen. <i>Mushtaq Ahmad, Nasim Ahmad</i> .....	112
Biometric Evaluation of the Testis of Adult Male Goat ( <i>Capra-hircus</i> ). <i>Hamayun Khan, Mohammad Misri Rind, Ikhwan Khan, Muhammad Subhan Qureshi, Muhammad Saleem Khan</i> .....	115
Productive and Reproductive performance of Imported French Alpine Goats under Subtropical Conditions in Egypt. <i>Elsaid Oudah</i> .....	118
Genetic Parameters Estimate for Economically Important Traits in the Egyptian Nubian Goats. <i>Helmy R. Metawi, Amed L. Desoky, Mona A.Osman, Fayek H. Farag, Nazem N. Shalabi</i> .....	122
Effects of Prostaglandin Concentration on Estrous Percentage of Etawah Grade. <i>Umi Adiati, Lisa Praharani</i> .....	125
Individual Variation on the Sperm Freezing Capability of Etawah Grade. <i>Iis Arifiantini, W.M.M. Nally, Tati Susnawati, Emi Rochmiati</i> .....	128
Activities of Assistance Service as The Initial Program to Establish Village Breeding Center of Etawah Grade Goat at Samigaluh Kulon Progo. <i>Yuni Suranindyah, Ristianto Utomo, Diah Maharani, Tri A. Kusumastuti, Rihastuti, Setyono</i> .....	131

Response and Characteristic of Estrous of Etawah Grade Goats after Different Routes of Prostaglandin Applicaton. <i>Mohamad A. Setiadi, Kadek D. Setiawan, Elvi D. Yunitasari</i> .....	135
<b>Feed and Nutrition</b>	
Nutrients Intake and Milk Composition of Lactating West African Dwarf Does Fed Varying Levels of Microbial Degraded Corncob Diets. <i>Adebowale N. Fajemisin, Ayo Oluyede, Gladys A. Ibhaze, Oluwasola J. Agbede, Adebayo J. Alokan, Adesola J. Fajemisin</i> .....	141
Milk Constituents of West African Dwarf Goats Fed Corncob Based Silage. <i>Gladys A Ibhaze, Olusola A. Olorunnisomo, Adebowale N. Fajemisin</i> .....	145
The Growth Performance of Philippine Native Goats ( <i>Capra hircus</i> Linn.) Fed Different Neutral Detergent Fiber Ratio from Forage and Concentrate. <i>Dwiatmoko Nugroho, Sunarso, Cesar C. Sevilla, Amando A. Angeles</i> .....	149
Blood Biochemical Parameters of Shami Goats Fed Sorghum Stalk. <i>Murtada B. M. Elimam</i> .....	152
The Use of Coffee Husk Fermented with <i>Pleurotus ostreatus</i> as Feed Supplement Improved Haematological Properties in Etawah Dairy Goat Suffered from Subclinical Mastitis. <i>Irma Badarina, Dwierra Evvyernie, Elis N. Herliyana, Latifah K. Darusman, Toto Toharmat</i> .....	155
The Effects of <i>Leucaena Leucocephala</i> Added to Para Grass in Different Proportions to Form Mixed Diets on Mimosine, Di-hydroxypyridine (DHP) in Urine, Milk, Thyroid Hormones in Dairy Goats. <i>Thongsuk Jetana, Sungworn Usawang, Sirima Thongrauy</i> .....	158
A Review of Coffee Pulp and Outer Skin of Coffee as Goat Feed. <i>Diah Asri Erowati</i> .....	162
Nutritional Basis of Adaptation of Goats to Changing Climate in Pakistan. <i>Ghulam Habib</i> .....	164
Feed Intake, Daily Gain and Feed Conversion of Ettawah Cross Bred Goat Fed Ration Containing Fermentated Rice Bran. <i>Andi Murlina Tasse, D. Evvyernie, Rahman</i> .....	170
Is Goat Milk Superior for Longevity and Sound Health? The Inside Happening Taurine Factor. <i>R.C. Gupta, S.P. Tiwari</i> .....	174
<i>In Vitro</i> Digestibility of <i>Indigofera zollingeriana</i> and <i>Leucaena leucocephala</i> Planted in Peatland. <i>Arsyadi Ali, Luki Abdullah, Panca Dewi M. H. Karti, Muhammad A. Chozin</i> .....	179
<i>In Vitro</i> Evaluation of Dates Fruit Waste as an Energy Source in Dairy Goat Ration. <i>Endah Yuniarti, Dwierra Evvyernie, Dewi Apri Astuti</i> .....	182
The Effect of Dietary Barley Grain Substitution with Hydroponic Barley Grass on Performance of Saanen Dairy Goats. <i>Reza Valizadeh, Saherea Hayati, Abbas A Naserian, Abdolmansor Tahmasebi</i> .....	185

Effect of Grazing on Some Bioactive Compounds of Goat Milk. <i>Ferenc Pajor, Péter Póti</i> .....	188
Pelletized Forage-based Ration for Lactating Goats. <i>Edgar A. Orden, Emilio M. Cruz, Armando N. Espino, Ma. Excelsis M. Orden, Neal A. Del Rosario</i> .....	190
Ruminal Fatty Acid Profiles of Leaves from Some Leguminous Tree Species as Incubated in an <i>in Vitro</i> Fermentation System. <i>Anuraga Jayanegara, Muhammad Ridla, Erika B. Laconi, Nahrowi</i> .....	193
<b>Productivity of Crossbred Ettawah Goats Fed by-Product of Traditional Fried Snack Industry with Different Level of Urea. <i>A Rai Somaning Asih, Ketut G. Wiryawan, I Nyoman Sadia, Kertanegara</i>.....</b>	<b>196</b>
Effect of Administration of Clove and Orange Peel Oils on Milk Yield and Composition in Dairy Goat. <i>M. Nasir Rofiq, Murat Gorgulu</i> .....	199
Effect of Glucose Concentration on the Production of $\beta$ -glucan by <i>Saccharomyces cerevisiae</i> . <i>Laras Cempaka, I. Nyoman P. Aryantha</i> .....	202
Growth Performance of Taggar Female Kids as Affected by Type of Concentrate Rations Under Dry Land Farming in Western Sudan. <i>Ibrahim Bushara, Murtada Elimam, Abdel Moneim M. Abu Nikhiala, D.M. Mekki</i> .....	205
Development of Multi-Nutrient No Molasses Feed Supplement for Improving Milk Productivity on Early Lactation Dairy Goats. <i>Suharyono, Nadia Litasova, Asih Kurniawati, Adiarto</i> .....	209
Locally Tree For Ettawa Crossbred Dairy Goat Feed. <i>Asmah Hidayati, Imbang D. Rahayu, Sri Samssundari</i> .....	213
Unsaturated Fatty Acid Content of Milk from PE Goat Fed with Palm Oil Sludge Meal and Tea Waste Combination. <i>Muhammad Arifin, Afton Attabany, Anita S. Tjakradidjaja</i> .....	216
Influence of Diets on Milk Production and Composition of Etawah Grade Does Reared in Mined Land Reclamation. <i>Muhamad Baihaqi, Euis Widaningsih, Asnath M. Fuah</i> .....	219
Milk Production of Late Lactation Dairy Goat Fed PUFA-Diet Supplemented with Yeast and <i>C. xanthorrhiza</i> Roxb. <i>Endang Sulistyowati, Asep Sudarman, Komang G. Wiryawan, Toto Toharmat</i> .....	223
The Use of Cassava ( <i>Manihot esculenta</i> ) Leaf Silage as Protein Source Feed on Intake, Digestibility and Milk Production of Etawah Crossbred Goat. <i>Asep Sudarman, Novicha Sofriani, Yeni Widiawati</i> .....	227
Productivity of Ettawah Crossbreed Goat Supplemented with Yeast Probiotic R1 and R2. <i>Teguh Wahyono, Irawan Sugoro</i> .....	230
Herbage Production of Brown Midrib (bmr) and Conventional Sorghum Fertilized with Different Level of Organic Fertilizer as Forage Source for Goat. <i>Widhi Kurniawan, L. Abdullah, Panca D. M. H. Karti, Supriyanto</i> .....	233



Effects of Different Levels of Neutral Detergent Fiber in Diets on Feed Intake, Nutrient Digestibility and Rumen Parameters of Bach Thao Goat in The Mekong Delta of Vietnam. <i>Nguyen Thi Kim Dong, Nguyen Van Thu</i> .....	237
Manure and Urea Fertilizer Application on Productivity of King Grass ( <i>Pennisetum purpureoides</i> ). <i>Iin Susilawati, Lizah Khairani, Eliza Octaviani Perwata</i> .....	241
Performance of Dairy Goat Fed Diets Supplemented with Garlic Powder ( <i>Allium Sativum</i> ) and Organic Mineral. <i>Caribu Hadi Prayitno, Yusuf Subagyo, Suwarno</i> ...	244
Nutritional Quality and Milk Production of Complete Feed from Forage for Dairy Goats. <i>Panca D. M. H. Karti, D.A. Astuti, A.M. Fuah, M. Baihaqi, H. Apriyani</i> ....	248
Antioxidant as Feed Additive Given to Etawah Grade Bucks Kept in Different Micro-Climates Environment (26 versus 34 °C). <i>Muhammad Winugroho, Yeni Widiawati, Tatan Kostaman</i> .....	251
Treatment of Sago Pith Waste by Fungal Solid State Fermentation. <i>Azilah Ab Jalil, Norhani Abdullah, Ehsan Oskoueian</i> .....	254
Effect of Protein Level in Concentrate Diets on Progesterone Concentration in Etawah Grade Goat. <i>Supriyati, Lisa Praharani, I Gusti Made Budiarsana, I-Ketututama</i> .....	257
Nutrient Intake and Digestibility of Etawah Grade Goat Fed Diet Supplemented Multi-Nutrient No Molasses Feed Supplement. <i>Asih Kurniawati, Vincentia Desi Pramudyastuti, Adiarto, Suharyono</i> .....	261

## **Dairy Goat Management**

Constraints to, Challenges, and Opportunities for Rearing Goats in Bali Province. A Case Study: Rearing Goats in Banjar Belulang, Sepang Village. <i>Lindawati Doloksaribu, Peter J. Murray, Richard S. Copland, Brenda P. McLachlan</i> .....	267
Adoption of Scientific Goat Management Practices and Constraints Faced by Goat Farmers in Sirohi District of Rajasthan, India. <i>Jagdish Lal Chaudhary</i> .....	270
A Pilot Epidemiological Survey of Parasitic Problems of Goats in and around Derawar Fort Area, Cholistan. <i>Khalid Mehmood, Ahmad W. Akhtar, Muhammad T. Riaz, Ahmad J. Sabir, Muhammad Ijaz, Aneela Z. Durrani, Musadiq Idris</i> .....	274
Milk Producing Ability of Saanen Does Under Intensive Management. <i>Anneke Anggraeni</i> .....	276
Comparison of Models for Describing the Lactation Curve of Saanen Goat in Thailand. <i>Mongkol Thepparat, Sansak Nakavisut, Suwit Anothaisinthawee, Thunchira Thepparat</i> .....	279
Recording Application for Ettawa-Crossed Goat Herd Improvement: A Case Study in Samigaluh, Kulon Progo District. <i>Dyah Maharani, Tety Hartatik, Yuni Suranindyah, Sumadi</i> .....	282
Assessment of Marica Goat Meat Producers in Jeneponto Regency, South Sulawesi Province. <i>Novia Qomariyah, Matheus Sariubang, Andi Ella</i> .....	285

Casein Micelles of Goat's Milk Physical Properties in Semi-Intensive Production System. <i>Hoda M. El-Zeini, Moneir M. El-Abd, Kamal A. Sorya, Shaimaa G. Abo Hasiba</i> .....	290
<b>Health and Diseases</b>	
The Possibility of Protein A as a Virulence Factor of <i>Staphylococcus aureus</i> in Subclinical Mastitis in Goat. <i>Siti Gusti Ningrum, Wyanda Arnafia, I Wayan Teguh Wibawan</i> .....	305
Pathological Studies of Caseous Lymphadenitis in Small Ruminants. <i>Muhammad Yunus, Ghulam Mustafa, Muti Ur Rehman, Aftab Anjum, Muhammad Raza Hameed, Iahtasham Khan</i> .....	308
<b>Milk and Milk Product</b>	
Microbiological and Biochemical Changes during Ripening of Lyghvan-a Raw Ewe's and Goats Milk Cheese from the Tabriz (Iran). <i>Parisa Rashtchi, Ali Bazmi, Hasn Moosavy, Elham Noormohamadi</i> .....	315
Investigation of the Microbial, Physicochemical and Sensory Properties of Traditional Yoghurt Produced from Milk of Goat and Ewe and Packaged in Tin Can during the Storage Period. <i>Sepide Eftekhari, Parisa Rashtchi, Mohamad Ehsani</i> ....	318
Chemical and Sensory Properties of Kefir Produced from Goat Milk and Extract Soybean. <i>Nurliyani, Eni Harmayani, Sunarti, Feny Prabawati</i> .....	321
Antihypertensive Activity of Lactic Acid Bacteria Fermented Goat Milk Casein on DOCA-Salt Induced Hypertensive Rats. <i>Masdiana Padaga, Aulanni'am</i> .....	325
Effect of Various Sources of Fat Ingredients on the Properties of Goat Milk Ice Cream. <i>Tosporn Namhong, Sanae Buasanit, Siriwan Suknikom</i> .....	328
Concentrated Yogurt Production from Etawah Grade Goat Milk Using Two Different Methods of Whey Removal. <i>Juni Sumarmono, Mardiaty Sulistyowati, Soenarto</i> .....	332
Microbiological Study of Goat Milk Kefir with Different Kefir Grain Concentrations and pH Controls during Fermentation. <i>Triana Setyawardani, Agustinus H.D. Rahardjo, Mardiaty Sulistyowati, Samsu Wasito, Juni Sumarmono</i> .....	335
Functional Properties of Yoghurt Goat Milk With Probiotic and Roselle ( <i>Hibiscus Sabdariffa</i> ) Extract. <i>Dewi Elfrida Sihombing, Irma Isnafia Arief, Sri Budiarti, Ria Putri Rahmadani</i> .....	338
<b>Economic and Social Economic</b>	
Prospect of Dairy Goat Production for Small-Scale Enterprise in Payakumbuh West Sumatra. <i>Khalil, Reswati</i> .....	345
Enhancement of Goat Productivity through Micro Finance Banking in Mardan Pakistan. <i>Naushad Khan, Munir Khan, Hamayun Khan</i> .....	349



Development of Micro Finance Institutions Model in The Rural Farmer Groups to Support Sustainable Agribusiness of Dairy Goats: A Pilot Study. <i>Rini Widiati, Yuni Suranindyah, Trisakti Haryadi</i> .....	352
<b>Poster Presentation</b>	
Correction Factors of Lactation Length and Lactation Period on Milk Yield in Saanen Goat. <i>Anneke Anggraeni</i> .....	357
Ruminal Fatty Acid Profiles of Leaves from Some Leguminous Tree Species as Incubated in an <i>In Vitro</i> Fermentation System. <i>Anuraga Jayanegara, Muhammad Ridla, Erika B. Laconi, Nahrowi</i> .....	360
High Quality Ration to Induce Milk Fat of Etawah Crossbread Goat. <i>K. B. Satoto, K. G. Wiryawan, D. A. Astuti, L. Khotijah, D. M. Fassah, K. Komalasari</i> .....	363
<b>Index of Authors</b>	<b>ccclxvii</b>
<b>List of Committees</b>	<b>ccclxx</b>
<b>Seminar Program</b>	<b>ccclxxii</b>
<b>List of Participant</b>	<b>ccclxxxi</b>
<b>Acknowledgement</b>	

Productivity of Crossbred Ettawah Goats Fed by-Product of  
Traditional Fried Snack Industry with  
Different Level of Urea

A Rai Somaning Asih\*, Ketut G. Wiryawan, I Nyoman Sadia, Kertanegara  
Faculty of Animal Sciences, Mataram University, Mataram, 83125, Indonesia

\*Corresponding author: asihrai@gmail.com

**Abstract** The purposes of this study were to evaluate the effect of urea levels in the concentrate consisted of 1:1 "rontokan gorengan" (by-product of traditional fried snack industry) and rice bran on feed intakes, body weight, milk production, average daily gain (ADG) of their offspring and digestibility of crossbred Ettawah fed native grass and banana peel as basal diets. Fifteen lactating crossbred Ettawah does were divided into three groups (5 goats each) fed one of dietary concentrate treatments (1%, 2% and 3% urea) and arranged according to Completely randomized Design. There were no significant differences on feed intake, milk production and digestibility, except fibre and N digestibility were significantly increased for diet with 3% urea ( $P < 0.05$ ). At the end of the experiment, the does receiving diet with 1% urea lost significantly ( $P < 0.05$ ) in body weight, while those receiving diet containing urea higher than 1% gained weight. The results indicate that feeding lactating crossbred Ettawah with a basal diet of field grass and banana peel and concentrate based on "rontokan gorengan" and rice bran (1:1) containing up to 3% urea give beneficial effects.

**Keywords** By-product, Milk production, Weight gain, Digestibility

## 1. Introduction

Growth and milk production patterns are depend on the management, quality and quantity of available feed, health management and climate. An availability of feed is a predominant factor determining efficiency of dairy goat production, because the cost of feed in dairy goats is the highest amongst the operational cost [1]. In developing countries, therefore, alternative feeds which are locally available, unconventional and sometime pollute environment should be found out. In Mataram, by products of traditional fried snack industry ("Gorengan") such as banana peel, cassava peel, jack fruit peel and "rontokan gorengan" (by-product of gorengan) are polluting the traditional market environments and the rivers around the city, result in spreading out bad smell and pathogenic bacteria. It is caused by the unawareness of a healthy environment. Recently, these kinds of by-products are being utilized by "the Gopal a goat farm" for feeding Ettawah crossbred goats. However, those feedstuffs are given ad libitum and free choice without considering level of nutrient intake of these feed which are rich in fermentable energy but lack of protein. In this case, adding urea is a cheap possibility to enrich the nutrient for increasing the goats' productivity. Therefore, the experiment was conducted to evaluate the milk production, average daily gain of the pre-weaning off spring and digestibility in Ettawah crossbred does given concentrate containing different levels of urea.

## 2. Materials and Methods

Fifteen lactating Ettawah crossbred does (a month lactating period) were divided into three groups of five goats each and given one of three concentrates treatments (Table 1) according to Completely Randomized Design.

Table 1. The composition of concentrate treatments as feeds

Treatments	Rice bran (%)	"Rontokan gorengan" (%)	Urea (%)	Mineral (%)
U1	48.5	48.5	1.0	2.0
U2	48.0	48.0	2.0	2.0
U3	47.5	47.5	3.0	2.0

"Rontokan gorengan" is by-product of traditional fried snack industry which is separated from the main products. Mineral is specific for goats and sheep produced by Eka Parma, Semarang.

The goats were penned in individual cages and the feeding technique is shown in Table 2. Milk production was measured for 8 weeks, continued by a week digestibility measurement and the pre-weaning off spring were weighted weekly for 10 weeks to calculate the average daily gain. Data were analyzed using PROC GLM [3] and differences between treatment means were tested with Duncan multiple range test.

Table 2. Frequency, feeding time and amount of feed given to each goat in different dietary treatments

Feeds	U1	U2	U3	Frequency and time given
Native grass	ad-lib	ad-lib	ad-lib	Three times a day (in the morning; noon; evening)
Concentrate (g)	500	500	500	Once a day (in the morning)
Banana peel (g)	750	750	750	Once a day (in the morning)

## 3. Results and Discussion

Intake, milk production, body weight, average daily gain of pre-weaned offsprings, and digestibility are presented in Table 3. Milk production was not influenced by the urea levels in the concentrates, since the intake and digestibility (DM, OM and fat) were not significantly different ( $P>0.05$ ) among urea treatments (Table 3). Consequently, the ADG of pre-weaned offsprings were also not significantly different. However, the does receiving concentrate containing only 1% urea lost 1.125 kg weight at the end of the experiment. In contrast, those goats receiving 2% and 3% urea gained weight of 0.625 and 1.0 kg respectively. This might be caused by significant increase in digestibility of fiber and N when the does were fed concentrate containing 3% urea, so that the does were not necessarily sacrifice their body tissue to fulfill their nutrient needs. These findings were in accordance with those reported by [3] that increasing levels of protein in concentrates improved the digestibility of dietary fiber and protein, but did not affect digestibility of DM and OM. Different protein sources (soybean meal, cotton seed meal and urea) in the concentrates contained similar amount of energy did not affect microbial protein synthesis in the rumen of the

goats [2] and there is still an opportunity to utilize urea to enrich certain unconventional by-product for goats.

Table 3. Intake, milk production and digestibility of lactating crossbred goats receiving various dietary treatments and ADG of pre-weaned off spring.

Parameter	U1	U2	U3	SEM	P-value
Intake					
DM (kg/day).	1.31	1.24	1.33	0.0383	0.230
DM per kg body weight (%)	4.12	3.77	3.62	0.2839	0.472
Production					
Milk production (ml)	728.5	680.0	705	73.1830	0.686
Body weight change (kg)	-1.125 <sup>b</sup>	0.625 <sup>a</sup>	1.00 <sup>a</sup>	0.5368	0.045
ADG of pre-weaning off spring (g/day)	144.03	139.75	145.11	12.2811	0.716
Digestibility (%)					
DM	84.3	82.5	85.1	1.2506	0.398
OM	85.6	84.2	86.7	1.1427	0.388
Fat	74.5	66.5	71.1	3.0880	0.337
Fiber	63.6 <sup>a</sup>	69.5 <sup>a</sup>	81.0 <sup>b</sup>	2.1637	0.001
N	68.3 <sup>a</sup>	71.5	78.2 <sup>b</sup>	2.224	0.054

U1, 1% urea, U2, 2% urea, U3, 3% urea in the concentrates

Different superscripts within the same row are statistically different at P<0.05

#### 4. Conclusion

Feeding lactating crossbred Ettawah with a basal diet of native grass and banana peel and concentrate ("rontokan gorengan" and rice bran at the ratio of 1:1) containing up to 3% urea give beneficial effects.

#### 5. References

- [1] A.R.S. Asih, Pengembangan Peternakan Kambing Peranakan Ettawa (PE) Sebagai Pendukung Pengembangan Agro-ekowisata Di Nusa Tenggara Barat. Prosiding Seminar Nasional: Optimalisasi Ipteks Untuk Pengembangan Pariwisata Berkelanjutan, Universitas Mataram. 12-9-2013 (in press).
- [2] A.R.S. Asih, A. R. S., K.G. Wiryawan and B.A. Young, Nitrogen Utilization by Dairy Goats Offered Different Nitrogen Sources as Supplements in High Iso-caloric Energy Concentrates. J. Indon.Trop Anim.Agric. 36 (2011) 36-42.
- [3] M.S. Badamana and J.D. Sutton. Hay intake, milk production and rumen fermentation in British Saanen goats given concentrates varying widely in protein concentration. Anim. Prod. 54 (1992) 395-403.
- [4] SAS Institute Inc. SAS/STAT User's Guide, version 6, 4th ed., SAS Institute Inc., Cary, NC.USA, 1990.



AADGN



**FACULTY OF ANIMAL SCIENCE BOGOR AGRICULTURAL UNIVERSITY**

and

**ASIAN-AUSTRALASIAN DAIRY GOAT NETWORK**

# *Certificate*

is presented to

**Ir. A. Rai Somaning Asih**

for active contribution as

*presenter*

**The 2<sup>nd</sup> Asian-Australasian Dairy Goat Conference**

**Bogor, April 25-27<sup>th</sup>, 2014**

Chairperson,  
AADGC 2014

Prof. Dr. Dewi Apri Astuti, MS

President of AADGN

Dr. Juan Boo Liang

Dean  
Faculty of Animal Science  
Bogor Agricultural University

Prof. Dr. Luki Abdullah, M.Sc. Agr