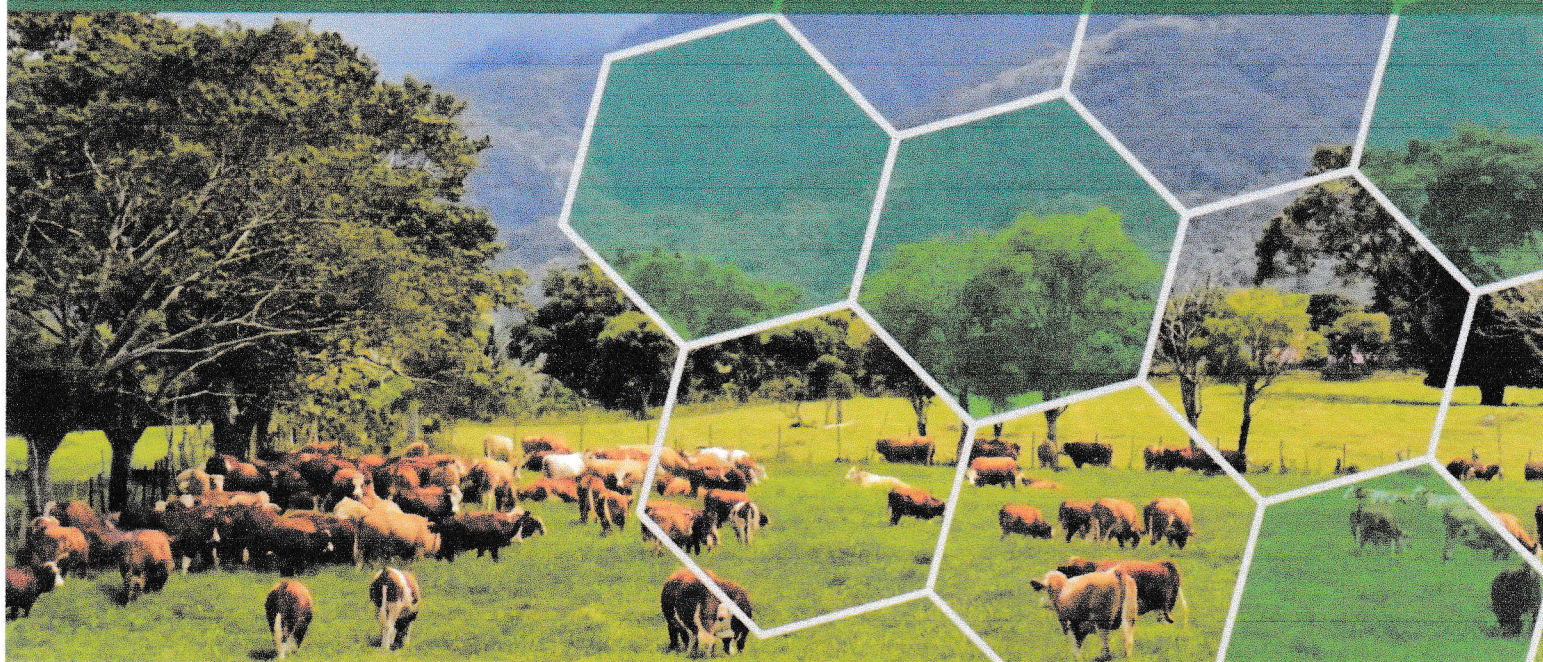




# PROCEEDING INTERNATIONAL CONFERENCE 6<sup>th</sup> SAADC 2017

Conference on Sustainable Animal Agriculture for Developing Countries

**"WISDOM OF USING LOCAL RESOURCES FOR DEVELOPMENT OF  
SUSTAINABLE ANIMAL PRODUCTION IN DEVELOPING COUNTRIES"**



The Singhasari Resort, Batu City, Indonesia, October 16-19, 2017

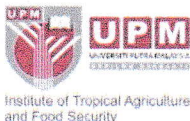
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## PROCEEDING

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October 16-19, 2017

The Singhasari Resort, Batu City, Indonesia

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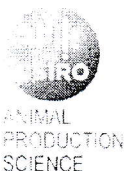
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## PREFACE

It is my privilege to thank all of the authors for your enthusiasm in participating and contributing papers at this 6<sup>th</sup> International Conference on Sustainable Animal Agriculture for Developing Countries (The 6<sup>th</sup> SAADC-2017) that had been successfully held on 16-19 October 2017 in The Singhasari Resort, Batu City, Indonesia with the theme of "*Wisdom of Using Local Resources for Development of Sustainable Animal Production in Developing Countries*"

The primary objective of the 6<sup>th</sup> SAADC-2017 was to provide a scientific forum for animal scientists and producers, and administrators of livestock related agencies, particularly from the developing countries, to share their experiences, discuss issues and suggest recommendations to develop further a more sustainable livestock production.

This proceeding contains selected papers that were presented in the conference based on the quality and relevancy to the conference. The papers are reflecting responsiveness of animal scientists from various countries in promoting sustainability of animal agriculture for the prosperity of the never ending generations. These proceedings hopefully will certainly enrich the body of knowledge and understanding about various aspects related to sustainable animal agriculture.

Our special thanks are also for the SAADC President for his confidence to our Universitas Brawijaya to organize this prestigious conference. Also, congratulations that SAADC is now listed in the International Congress and Conference Association (ICCA) based on its quality and consistent activities.

We also wish to thank all partners and sponsors for their support to the success of the conference. To colleague members of the organizing committee, please accept my deep appreciation for your hard working in ensuring the success of the conference.

Yours Sincerely,

Prof. Ifar Subagiyo  
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## TABLE OF CONTENTS

### KEYNOTE ADDRESS AND INVITED SPEAKER

Keynote Address	Making money from milk on small-holder dairy farms in the tropics: an international perspective <i>P.C. Wynn, S.S. Godfrey, N. Aslam, H.S. Warriach, S. Tufail, M. Jahan, Z. Batool, B. Wang and D.M. McGill</i>	1
Invited Speaker	Robust study design for animal production in developing countries <i>Peter C. Thomson</i>	9
Invited Speaker	Implementation of breeding programme for sustainable livestock production in tropical countries <i>A.K. Thiruvankadan</i>	14
Invited Speaker	Symbiotic relationship and sustainable agriculture <i>K.G. Dande</i>	21
Invited Speaker	Herd characteristic, feed resource and socioeconomic aspect of smallholder dairy farm in Lampang province, northern Thailand <i>S. Wittayakun, W. Innaree, W. Chainetr and J. Lerdsri</i>	27
Invited Speaker	Towards a cost-effective feeding of broiler chickens <i>Zulkifli Idrus</i>	31

### ORAL PRESENTATION

#### Animal Production

AP – 107	Plasma leptin ghrelin and their expression of receptors in different tissues and on production performance during post summer period in PD 3 chicken line <i>Anandlaxmi N., Reddy M.R., Raja Ravindra, Ramasubbaiah K., Pradeep Kumar E.R., Shanmugam M. and Mahapatra R.K</i>	36
AP – 108	Egg yolk cholesterol and serum metabolites of laying hens fed dried tomato ( <i>Solanum lycopersicum L</i> ) meal in diet <i>Leke J., J. S.Mandey, F. Ratulangi, D. Rembet and S. E. Surtijono</i>	40
AP – 109	Carcass quality as well as composition and oxidative stability of the meat of crossbreds of Thai indigenous chickens and a layer breed as compared with purebred Thai indigenous, layer and broiler chickens <i>C. Kaewkot, M. Kreuzer and S. Jaturasitha</i>	43
AP – 110	Effect of genotype on productive and reproductive traits of Desert and Taggari goats managed under natural grazing during rainy season <i>I. Bushara., Hind. A. Salih., Mohamed, O. Mudalal Dafalla and M. Mekki</i>	47
AP – 112	Dairy cattle biogas unit sludge on the nutrient of rice straw compost <i>Mochammad Junus</i>	51
AP – 116	Effect of rice hull inclusion with and without enzymes on growth performance and digestive traits of broilers <i>Hartini, S., D.D. Rahardjo and P. Purwaningsih</i>	54
AP – 117	The effect of restricted feeding to reproductive performance on sexual maturity of quail ( <i>Coturnix coturnix japonica</i> ) <i>Rosa Tri Hertamawati, Suyadi, Edhy Soedjarwo and Osfar Sjojfan</i>	58
AP – 120	Behaviour of imported brahman cross cows maintained by smallholder farmers <i>Tri Satya Mastuti Widi, Diah Tri Widayati, Sidiq Tri Pamungkas and Ulfadina Syahdianti</i>	61

AP – 121	Comparison of performance, incidence of foot pad dermatitis, and gut microflora of broiler chickens raised on floor pens and in cages in a tropical environment <i>M.S. Zulfahmi, N.N. Syafiq, I. Zulkifli, E.A. Awad and A.F. Soleimani</i>	64
AP – 122	The effect of daylight transportation through body weight loss and physiology response between sheep and lambs <i>A. P. Hermanto, A. Prima, N. Luthfi and A. Purnomoadi</i>	67
AP – 127	The productivity of Kejobong and Bligon Goats, local Indonesian goats developed by farmers <i>I Gede Suparta Budisatria, Panjono, Ali Agus, and H.M.J. Udo</i>	71
AP – 130	Carcass characteristic of Bali bull on different ages <i>Kuswati, Lestari, T.J., Mahatvayoga, Y.A. and Nugroho, H</i>	75
AP – 133	Effect of time of first colostrums feeding on serum immunoglobulin concentration and body weight gain in Friesian Holstein calves <i>Tri Eko Susilorini, Pratiwi Trisunuwati and Rojaunaz Zulfa L</i>	78
AP – 134	Characteristics of goat farm based on farmer's profile and goat population in Senduro Village, Lumajang Regency, East Java, Indonesia <i>F.T. Saputra, P. Surjowardojo, and Irdaf</i>	81
AP – 136	Poultry industry and strategy for sustainable development to 2020 <i>Dau N.T and Thuy Linh N</i>	84
AP – 155	The nutritive value of feed for raising sheep in the southern border of Thailand <i>S. Jantarat, T. Kraiprom and A. Samae</i>	88
<b>Animal Nutrition and Feed Technology</b>		
ANF – 201	Feeding microparticle protein-composed diet on protease activity and protein utilization in broiler chickens <i>N. Suthama and P.J. Wibawa</i>	91
ANF – 204	The biological quality of adding fermented cabbage waste as probiotic to pellet calf starter diet on calf performance <i>Mukodiningsih S., J. Achmadi, F. Wahyono, E. Pangestu and S.J. Ohh</i>	94
ANF – 205	Dietary inclusion of carrot ( <i>Daucus carota L</i> ) waste meal on performance and egg quality of laying hens after peak egg production <i>L.D. Mahfudz, W. Sarengat, and N. Suthama</i>	97
ANF – 206	Early feed restriction and <i>ad libitum</i> methods on broiler performance <i>N.G.A. Mulyantini and St.Y.F.G. Dillak</i>	100
ANF – 207	Evaluation of <i>in vitro</i> digestibility complete feed based on corncob as main feed formulation with different fermentation time <i>Sitti Wajizah, Muhammad Akbar Yusren, and Samadi</i>	103
ANF – 208	The effect of lempuyang ( <i>Zingiber zerumbet</i> ) in the organic feed towards nutritive contents of kampung chicken meat <i>Wahyu Widodo, Rahayu, I.D., and Sutanto, A.</i>	106
ANF – 209	Potential of bioactive compounds <i>Archidendron jiringa</i> by product to be natural feed additive for sustainable animal production <i>Nur Hidayah and Suliasih</i>	110
ANF – 210	Using durian seed ( <i>Durio zibethimus</i> ) to support living kampung chicken/KC in Indonesia villages <i>N. Ginting, L.D. Manalu, and B. Simanullang</i>	116

## The biological quality of adding fermented cabbage waste as probiotic to pellet calf starter diet on calf performance

Mukodiningsih S.<sup>1</sup>, J. Achmadi<sup>1</sup>, F. Wahyono<sup>1</sup>, E. Pangestu<sup>1</sup> and S.J. Ohh<sup>2</sup>

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### Abstract

Newborn calf has an undeveloped rumen which tends to easily diarrhea caused by *E. coli* infection from the environment resulting in death. Feeding calf starter (CS) diet after birth can promote rumen development. Although giving antibiotic can suppress *E. coli* infection but it has negative effect. *Lactobacillus* sp is a probiotic bacterium (lactic acid bacteria) that can replace antibiotics. Waste cabbage naturally content *Lactobacillus* sp. but fermentation process can further increase the number of *Lactobacillus* sp in the waste cabbage. The aim of this research was to examine the effect of addition fermented waste cabbage (FWC) in calf starter diet on calf performance. Completely randomized design with 3 treatments (CS-L1: CS + 2% FWC, CS-L2: CS +4% FWC, CS-L3: CS +6% FWC) and 5 replications was employed for this study. The materials of CS were corn, soybean meal, rice bran, molasses, mineral mix and materials in FWC were cabbage waste, sugar and salt, 15 FH calf (2-6 weeks old). Feeding calf starter + FWC twice per day after giving milk. Water was given ad libitum. The parameters measured were calf starter intake and daily gain. The data were analyzed with ANOVA and Duncan's test. The result indicated that feeding of FWC had no effect on calf starter intake, but significantly improved ( $P<0.05$ ) average daily gain with addition of 6% fermented waste cabbage been the best.

*Keywords: calf starter, fermented waste cabbage, calf starter intake, body weight gain*

### Introduction

Optimal physical and metabolical development of reticulo-rumen can be achieved at 2-6 weeks after birth depending on feeding practices (Cunningham, 1992). Feeding calf starter combined with corn fodder and 5% molasses to one week old Friesian Holstein (FH) calves can promote rumen development (Mukodiningsih et al., 2010; 2016). However, proper management of calves after birth until weaning is critical as newly born calves are subjected to diarrhea related diseases resulting in high mortalit of up to 39% (Wudu et al., 2008). Diarrhea is generally caused by *Escherichia coli* from the environment and feeding feed containing antibiotic has been reported to reduce the population *E. coli*, but the above practice can resulted in drug residues in milk or meet product. Probiotic bacteria are beneficial bacteria that can suppress harmful bacteria in the digestive tract. It can be used as alternatively to antibiotics because probiotics are capable of maintaining the balance of intestinal micro flora in the digestive tract (Shitandi et al., 2007), and an increase serum and antibody IgA, IgM and IgG (Panda et al., 2008). The use of probiotic in large quantities does not have a negative effect, because probiotics are friendly and safe materials. *Lactobacillus* sp is a probiotic bacterium (lactic acid bacteria) that can suppress populations of *E. coli*. Cabbage waste is by product of cabbage's outer shells that naturally contains lactic acid bacteria and fermentation process can further increase its number. Inclusion of fermented

cabbage waste in pelleted calf starter as much as 6% produced the best quality of chemical, physical, microbiological pellet compared with 2 and 4% (Mukodiningsih et al, 2017). The aim of this study was to examine the effect of addition of fermented cabbage waste (FCW) in calf starter on calf performance.

## Methodology

The treatments of this study were (i) calf starter (CS) pellet plus 2% fermented cabbage waste (FCW), CS-L1; (ii) calf starter pellet plus 4% FCW, CS-L2 and (iii) calf starter pellet plus 6% FCW, CS-L3. The CS was formulated with yellow corn ground, rice bran, soybean meal, mineral mix and molasses (Mukodiningsih et al., 2010) to meet the nutrient requirement of calves with 18% protein and 75% TDN (NRC, 2001). Proximate and starch content were analyzed (AOAC, 1990), and NDF according to Van Soest (1994). The fermented cabbage waste consisted of cabbage leave blended and mixed with 6% salt and 6.4% sucrose (w/w) and fermented for 6 days. The above treatment diets were pelleted with steam conditioned at 75-80°C for about 15 seconds. The diameter of pellet was ~ 6mm, and then dried until final moisture content ~ 13%. The biology quality of the different diet-pellet was parameters observed, it used Frisian Holstein calves with aged 7-14 days and  $\pm$  35 kg-initial body weight. The experiment was done 6 weeks consist preliminary (1 week) and observation (5 weeks) using completely randomize design with 3 treatments and 5 replication. Calves feeding were 40% CS-L and 60% milk (NRC, 2001) given twice a day at 7:00 AM and 3:00 PM. The starter feed (CS-L) was given 30 min after giving milk (Morisse et al., 2000). Clean drinking water was provided ad libitum. Dry matter calf starter intake and body weight gain were determined. All data were analysed using the analysis of variant, and differences were compared using Duncan test (Still and Torrie, 1981).

## Results and discussion

Adding FWC in pellet of calf starter gave no significant effect on dry matter intake (DMI), but significant effect on average daily gain (ADG) (Table 1).

**Table 1.** Feed intake and average daily gain (ADG) of FH Calves

Treatments	Parameters	
	Dry matter intake (g/day)	ADG (kg/day)
CS-L1	103.82	0.71 <sup>a</sup>
CS-L2	117.79	0.60 <sup>a</sup>
CS-L3	109.21	1.03 <sup>b</sup>

\*superscript on the same column indicate significant different (P<0.05)

Although not significantly different, the dry matter intakes of calves in the CS-L1, CS-L2 and CS-L3 were within the range daily intake of solid feed for calves from 50 g at 3 weeks to 300 g at 17 weeks (Morisse at al., 2000; NRC, 2001). There was significant difference (P<0.05) in ADG with T3 treatment recorded the highest ADG. It was assumed that, increasingly FWC (6%) in calf starter also increases intake of lactic acid bacteria resulting in healthier calves in T3 compared to those in T1 and T2. The above suggestion was also reflected by the low population of E coli in feces from T3 calves ( $6.3 \times 10^6$  cfu / g) which is below the suggested value of  $10^9$  cfu / g standard by Boyd and Marr (1980).

## Conclusion

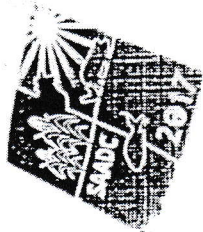
The formula calf starter added fermented waste cabbage 6% is the best.

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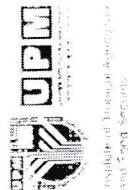
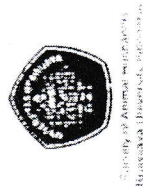
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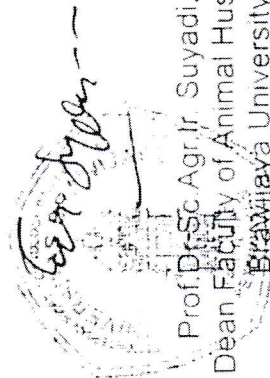
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