Proceeding

The 2nd Asian-Australasian Dairy Goat Conference

April 25-27th, 2014
IPB International Convention Centre Bogor, Indonesia

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

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Bogor Agricultural University

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Foreword from Chairperson of
Organizing Committee

Distinguished,

Director General of Livestock Services and Animal Health, Ministry of Agriculture, Republic of Indonesia, Ir Syukur Iwantoro, MS, MBA

Rector of Bogor Agricultural University, Prof Dr Heri Suhardianto

President of Asian-Australasian Dairy Goat Network, Dr JB Liang

Mayor of Bogor City, Dr Bima Arya

All participants of Asian-Australasian Dairy Goat Conference 2014

Good morning ladies and gentlemen, and Assalamualaikum wr wb.,

It is my pleasure to welcome you here for attending the Second Asian-Australasian Dairy Goat Conference at IPB International Convention Center, Bogor Indonesia. The theme of this conference is “The role of dairy goat industry in food security, sustainable agriculture production and economic community” which is organized by Bogor Agricultural University in collaboration with Asian Australasian Dairy Goat Network and Directorate General of Livestock Services and Animal Health, Ministry of Agriculture, Republic of Indonesia.

From the success of The First Asia Dairy Goat Conference on 9-12 April 2012 in Kuala Lumpur Malaysia, and to express the mission and the objective of Asian-Australasian Dairy Goat Network, it is necessary to continue the biannual dairy goat meeting in Bogor Indonesia. The primary objective of the second AADGC-2014 is to provide a platform for all stakeholders including researchers, academicians, policy makers, farmers, investors and other dairy industries to share experiences and networking to promote dairy goat farming in the Asian-Australasian region and beyond.

With saying Alhamdulillah, around 90 researchers from 16 countries around the world, 12 top universities and 4 research institutes in Indonesia have contributed some interesting topics to be discussed. The very important persons from 40 government livestock services officers in Indonesia, and more than 30 the best dairy goat farmers and companies from ASEAN counties are also with us here to make a forum group discussion in order to improve dairy goat production and markets. I have to stated here that all papers have been reviewed by the experienced international reviewers.

On behalf of the organizing committee we would like to welcome to all delegates from Malaysia, Thailand, India, Japan, Philippine, Vietnam, Iran, Pakistan, Australia, United Kingdom, Hungary, Egypt, Nigeria, Sudan and also from some provinces in Indonesia. To government livestock services officers and farmers from ASEAN countries and from east, middle and west

Java, and also some potential business companies, welcome and have a nice discussion. I hope this conference and network activities during 3 days will bring you new idea how to improve dairy goat for our lives and get more benefits for all participants.

We cannot make this event success without your contributions. In this occasion, I would like to express my great gratitude and thanks to FAO, AADGN, IPB, Directorate General of Livestock Services and Animal Health, Ministry of Agriculture, Republic of Indonesia, Ministry Coordinating Economic Affairs, Bank BRI, Mayor of Bogor City, PT Napindo, PT Chiel Jedang, PT Nutreco, and PT Yummi Indonesia that support and sponsor this conference.

Thank you very much to all VIP reviewers from international advisory and scientific committee, and also for hard working of all organizing committee.

Please enjoy the beauty of Bogor City with the legend of Bogor presidential palace and botanical garden.

Wassalamualaikum wr.wb.

Prof. Dr. Dewi Apri Astuti, MS
Chairperson
The 2nd AADGC 2014
25 April 2014

Ladies and Gentlemen,

The Asian-Australasian Dairy Goat Network (AADGN) was formed by a group of researchers and producers with common interest in dairy goat production during the First Asian Dairy Goat Conference held in Kuala Lumpur, Malaysia in April 2012. The main objective of the network is to facilitate contact among scientists, extension workers, farmers and other stakeholders in the dairy goat industry. In addition, the network hopes to enhance information exchange, provide technical support, and promote dairy goat farming in Asian-Australasian countries and beyond. The secretariat of the network in currently located at the Institute of Tropical Agriculture, Universiti Putra Malaysia (http://aadgn.upm.edu.my/aadgn/) and technically supported by an International Steering Committee and representatives from partner countries, currently made up of Australia, China, India, Indonesia, Iran, Iraq, Japan, Malaysia, Pakistan, the Philippines, Thailand and Vietnam.

One of the activities of AADGN is to organize regular conferences focusing on all aspects of dairy goat research and farming. On behalf of AADGN, I congratulate the Organizing Committee, chaired by Professor Dewi Apri Astuti, for successfully organized the AADGC2014. I was informed that one of the highlights of this conference is the active participation of local dairy goat farmers and producers. It is often reported that the robustness of goats to produce in harsh climatic environment with low quality roughages plays a vital role in food security and poverty alleviation in smallholder farmers in Asia and recently, there is also a growing interest in dairy goat farming as business enterprise in South-east Asia countries including Indonesia to meet the rapid increased demands for goats milk and its products. I trust this conference will provide a good opportunity for exchange of information and experience between the researchers and producers.

Yours sincerely

DR JUAN BOO LIANG
President AADGN
Remarks from Rector of
Bogor Agricultural University

Prof. Dr. Juan Boo Liang,
President, Asian-Australasian Dairy Goat Network (AADGN),

Ir. Syukur Iwantoro, MBA
Director General of Livestock and Animal Health-Ministry of Agriculture
Republic of Indonesia,

Dr. Bima Arya
Mayor of Bogor City

Distinguished foreign participants and speakers,

Representative of livestock services officers of local government from all over Indonesia,

Dairy goat farmer and businessman,

Colleagues,

Ladies and gentlemen,

Assalamu’alaikum warahmatullaahi wabarakatuhu,

A very pleasant and good morning to everyone, thank you very much for joining us at the 2nd Asian-Australasian Dairy Goat Conference (AADGC) 2014. I bid you a very warm welcome to Bogor Agricultural University (IPB) as well as to Bogor City, West Java Province.

I was informed that FAO joined with the University Putra Malaysia (UPM) and the International Dairy Federation (IDF) have organized the First Asia Dairy Goat Conference in Kuala Lumpur, Malaysia from 9 to 12 April 2012. At the same time the Asian-Australian Dairy Goat Network was established. That network is one of the successful indicators of the first conference apart from its important conclusions and recommendations. That conference has also recommended Indonesia to be the host of the Second Asian-Australasian Dairy Goat Conference (AADGC) 2014 with Prof. Dr. Dewi Apri Astuti, one of IPB professors from Faculty of Animal Science to be the country coordinator. We are indeed honored to have you now here with us at IPB. We have about 150 participants from 15 countries gathered here today, making our conference a truly international one.

According to FAO Statistics (2012), Indonesia is ranked 6th in Asia and 10th in the world for total goat population. FAO also reported that Indonesia produced 282,000 ton of fresh goat milk in 2012. Yet, we have no valid data on the number of dairy goat population among the total goat population. Dairy goat farming in Indonesia has been growing fast since about 10 years ago.
The development of dairy goat farming in our country is unique, because it started from community initiative and spread across the nation through their network. The increasing demand of milk and milk products is likely one of the driving force for dairy goat farmer to develop.

If we take our national population as denominator, our milk consumption per capita per year is still very low, it is only 12 liter/capita/year. However, the consumption level in big cities is quite high, that’s why our milk and milk products demand is increasing about 8% per year. Although the major portion of the demand is from cow milk, goat milk and milk products demand is also increase year by year.

As the present conference theme is “The Role of Dairy Goat Industry in Food Security, Sustainable Agriculture Production nd Economic Community” it is imperative to discuss alternative solutions to the above challenges by all participants as you are coming from different backgrounds. We have with us today representatives from research centers, universities, businessmen, government officers, students, farmers, and other interested persons. The conference will be more interesting as the organizing committee has set up special session for panel discussion between and among dairy goat farmers, local government livestock services officers, businessman and representative from Directorate General of Livestock and Animal Health, apart from scientific session.

I would like to take this opportunity to express my gratitude the Local Organizing Committee, chaired by Professor Dewi Apri Astuti, and the Dean of Faculty of Animal Science, for their hard work and effort in planning and coordinating this event. I would also like to thank the Directorate General of Livestock and Animal Health, Ministry of Agriculture Republic of Indonesia, Asian-Australasian Dairy Goat Network (AADGN), Food and Agriculture Organization (FAO-RAP), Mayor of Bogor City and Indonesia Association for Sheep and Goat Farmers for their support in making this conference possible.

The challenges made by the Conference are significant, but I am confident that you will succeed in your objectives. I wish you a very pleasant stay here in the IPB and in Bogor, and a productive and successful meeting.

By saying “Bismillaahirrahmaanirraahim…” I declare the Conference open.

Thank you and Wassalamu’alaikum Warahmatullaahi Wabarakaatuhu.

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Chemical and Sensory Properties of Kefir Produced from Goat milk and Extract Soybean

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Abstract This study was to investigate the effect of combining goat milk and extract soybean on the chemical and sensory qualities of kefir. Kefir was divided into 5 groups, produced from goat and extract soybean mixtures (100:0, 75:25, 50:50, 25:75, 0:100). The chemical analysis of kefir include moisture, fat, protein, ash and carbohydrate content, whereas the sensory properties include aroma, taste, effervescence, sourness, texture and acceptability. The chemical data was analyzed by one way ANOVA, whereas the data of sensory properties was analyzed by non-parametric Kruskal-Wallis method. The total solid of all kefir made from goat milk and extract soybean mixture was lower (P<0.01) than goat milk kefir. Carbohydrate of kefir made from goat milk and extract soybean mixture (75:25, 50:50) was lower (P<0.01) than goat milk kefir (100:0) or extract soybean kefir (0:100). While, the fat content of kefir made from goat milk and extract soybean mixture (50:50, 25:75) was lower than 100:0 or 75:25. There was no effect of the goat milk and extract soybean ratio in kefir on the protein and ash content. Extract soybean could affect the aroma and acceptability, but had no effect on taste, effervescence, sourness and texture of kefir. In conclusion, based on chemical composition, sensory quality and economic consideration, the best composite of kefir was obtained from the ratio of goat milk and extract soybean 50:50.

Keywords Chemical composition, Sensory quality, Goat milk, Extract soybean, Kefir

1. Introduction

Kefir is a acidic, mid alcholic, effervescent fermented drink from the Caucasian mountains and has become popular in many European countries [1],[2]. Goat milk has been recommended for children, elderly and convalescent persons due its good nutritional value, good digestibility and acceptability, and a low allergenic potential. However, it cannot be recommended to every child allergic to cow's milk, because in some cases, serious threat to life can also occur with goat milk [3]. Soy milk (and its products) could be an important resource for combating hunger and malnutrition in many developing countries [4]. However, soy milk and other soy beverages are often characterized as having unbalanced “beany” flavors and chalky mouthfeel. Therefore, formulation changes that enhance the overall flavor and textural characteristics of soy beverages may be necessary to further increase soy consumption [5]. The composition of kefir depends on the source and the fat content of milk, the composition of grains or cultures and the technological process of kefir [6]. However, the type of milk had greater influence on product characteristics and sensory profile than that of kefir starter cultures and their population development [7], [8]. To produce kefir from goat and soy milk mixture in developing country, dairy goat farming which is easier than dairy cows. This study investigated the effect
of combining goat milk and soymilk on the chemical and sensory qualities of kefir produced using Indonesian kefir grains.

2. Materials and Methods

Extract soybean was prepared according to [9], while production of kefir according to [8]. Kefir were divided into 5 groups with different ratio of goat milk and extract soybean (100:0, 75:25, 50:50, 25:75, 0:100), using 3 replications. Kefir samples were analyzed of chemical composition [10] and sensory evaluation. All kefir samples were evaluated by 10 semi trained panelists according to [11]. Chemical of kefir was analyzed statistically by one way ANOVA, whereas sensory quality was analyzed by non-parametric according to Kruskal- Wallis method.

3. Results and Discussions

The chemical composition of goat milk, extract soybean and kefir produced by goat milk, extract soybean and combination of goat milk and extract soybean given in Table 1.

Table 1. The average of chemical composition of goat milk, extract soybean and kefir made from goat milk and extract soybean mixtures

<table>
<thead>
<tr>
<th>Chemical composition</th>
<th>Goat milk</th>
<th>Extract soybean</th>
<th>Kefir</th>
<th>Kefir</th>
<th>Kefir</th>
<th>Kefir</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>100:0</td>
<td>75:25</td>
<td>50:50</td>
<td>25:75</td>
</tr>
<tr>
<td>Moisture %</td>
<td>86.94a</td>
<td>90.59b</td>
<td>87.28a</td>
<td>89.78b</td>
<td>90.79b</td>
<td>90.48b</td>
</tr>
<tr>
<td>Total solid</td>
<td>13.06a</td>
<td>9.41b</td>
<td>12.72a</td>
<td>10.22b</td>
<td>9.21b</td>
<td>9.52b</td>
</tr>
<tr>
<td>Fat %</td>
<td>3.52c</td>
<td>0.73a</td>
<td>3.33c</td>
<td>2.88c</td>
<td>2.13b</td>
<td>1.70b</td>
</tr>
<tr>
<td>Protein %</td>
<td>3.28a</td>
<td>3.01a</td>
<td>2.96a</td>
<td>2.98a</td>
<td>3.19a</td>
<td>3.15a</td>
</tr>
<tr>
<td>Ash %</td>
<td>0.66a</td>
<td>0.40a</td>
<td>0.51a</td>
<td>0.57a</td>
<td>0.52a</td>
<td>0.40a</td>
</tr>
<tr>
<td>Carbohydrate %</td>
<td>5.59d</td>
<td>5.26cd</td>
<td>5.90d</td>
<td>3.80b</td>
<td>3.36b</td>
<td>4.25b</td>
</tr>
</tbody>
</table>

The different letters in the same row indicates significantly different (P<0.01).

According to [12], protein and fat contents of kefir product were 2.7% and less than 10%, respectively. In the previous study by [7], the chemical composition of bovine, caprine and ovine milk kefir ranged from 10.6–14.9% for total solids, 2.9–6.4 % for crude protein, 3.8–4.7% for carbohydrate, and 7–11% for ash. The other study showed that chemical composition of goat milk kefir was 2.96% for protein, 3.3% for fat and 2.45 for lactose by using goat milk containing 3.02% protein, 3.8% fat and 3.29% lactose [13]. Total solid, protein, carbohydrate and ash of goat milk were 13.0%, 3.6%, 4.5% and 0.8%, respectively [8]. According to [4], combining cow milk with extract soybean increased the total solids, protein, ash, fat and carbohydrate contents of the yoghurt.

Table 2 gives the sensory quality analysis results for the samples. The score of taste, effervescence, sourness and texture of kefir samples were not significantly different. Similarly, aroma of kefir combination of goat and extract soybean was not significantly different.
Table 2. Sensory quality of kefir made from goat and extract soybean

<table>
<thead>
<tr>
<th>Sensory Quality</th>
<th>Kefir</th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100:0</td>
<td>75:25</td>
<td>50:50</td>
<td>25:75</td>
<td>0:100</td>
</tr>
<tr>
<td>Aroma</td>
<td>3.80</td>
<td>3.50</td>
<td>3.10</td>
<td>2.90</td>
<td>2.40</td>
</tr>
<tr>
<td>Taste</td>
<td>2.80</td>
<td>2.30</td>
<td>2.10</td>
<td>1.90</td>
<td>1.90</td>
</tr>
<tr>
<td>Effervescence</td>
<td>3.00</td>
<td>2.60</td>
<td>2.50</td>
<td>2.30</td>
<td>2.10</td>
</tr>
<tr>
<td>Soursness</td>
<td>3.20</td>
<td>3.30</td>
<td>2.90</td>
<td>3.00</td>
<td>2.20</td>
</tr>
<tr>
<td>Texture</td>
<td>3.50</td>
<td>3.30</td>
<td>3.40</td>
<td>3.40</td>
<td>2.70</td>
</tr>
<tr>
<td>Acceptability</td>
<td>2.50</td>
<td>2.00</td>
<td>1.80</td>
<td>1.90</td>
<td>1.40</td>
</tr>
</tbody>
</table>

The different letter in the same row indicates significantly different (P<0.05)

The score of goat milk kefir (100:0) was higher than kefir made from 50% goat milk and 50% extract soybean (50:50) or soy milk kefir (0:100), since the extract soybean had a beany flavor [5]. Therefore, can suggest using other natural raw materials like muesli or fruit, which can mask the unpleasant soy taste [14]. This study similar to the yoghurt study by [4], that yoghurt from cow milk premixes was most preferred, while that from plain extract soybean was least accepted. Addition of cow milk to extract soybean significantly improved the sensory attributes of yoghurt produced from extract soybean.

4. Conclusion

Based on chemical composition and sensory quality, the best of kefir was obtained from the ratio of goat milk and extract soybean 50:50. In addition, based on economic considerations to produce kefir with a good nutritional value but economically affordable, this kefir is a good ratio for nutrition improvement, especially in developing countries that many cases of malnutrition.

5. References

[8] H. Yaman, M. Elmali, U. Kambe. Observation of lactic acid bacteria and yeast populations during fermentation and cold storage in cow’s, ewe’s and goat’s milk kefirs. Kafkas Univ Vet Fak Derg,


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