PROCEEDING
International Seminar
THE ROLE OF VETERINARY SCIENCE TO SUPPORT MILLENNIUM DEVELOPMENT GOALS
AND THE 12TH ASIAN ASSOCIATION OF VETERINARY SCHOOLS CONGRESS

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UNIVERSITAS AIRLANGGA
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Ladies and Gentleman,
I have the honour of welcome delegates and speakers in International Seminar with the title "role of veterinary science to support milenium development goals" and highest ours appreciation for Your participation on this seminar.

The seminar will exchange information that we can carefully increasing the role of veterinary science to support development goals. Hopefully through this event will take advantage of the many opportunities to collaborative work between Indonesia institution and also with overseas institution.

On behalf of Organizing committee, I would like to express our sincere gratitude and thanks to all participant at this seminar international.

I hope that this program will be useful and enjoy during stay in Surabaya.

Best Regards
REMIX OF DEAN FACULTY OF VETERINARY MEDICINE
UNIVERSITAS AIRLANGGA AAVS PRESIDENT

Prof. Romziah Sidik, Ph.D., DVM.

Bismillahi rochmanir rochim,
Assalamu'alaikum warochmatullahi wabarokatu.

Good morning Ladies and Gentlemen,
Welcome to Surabaya, East Java – Indonesia.

On behalf Faculty of Veterinary Medicine, Universitas Airlangga and Asian Association of Veterinary Schools, I would like to say thank you for the Excellencies: Rector Universitas Airlangga, The Director General of Livestock and Animal Health-Ministry of Agriculture-Republic of Indonesia: Ir. Syukur Iwantoro, MS), The Coordinating Minister for people’s Welfare Republic of Indonesia: Dr. Agung Laksono; The OIE Sub Regional Representation for South-East-Asia delegates (Dr. Dirk Van Aken, Dr, Mary Joy Gordoncillo, Dr. Ronello Abila and Ms.Melada Ruengiumroonmath), the Presidents of SEAVSA (Dr. Srihadi agung Priyono) President of IVSA (Indonesian Veterinary School Association): Prof. Made Dhamriyasa, and all Deans of SEAVSA (South-East Asia Veterinary School Association) members, AAVS (Asian Association of Veterinary Schools: Japan, Korea, Taiwan, Indonesia, Malaysia, Thailand, Philippines, Mongolia, Vietnam, Myanmar, Lao and Cambodia) and IVSA (Indonesian Veterinary School Association), The President of Indonesia Veterinary Medicine Association: DVM.Wiwiek Bagja), Quarantine and Inspection Agency Commissioner of Korea: Prof Yong Ho Park), Secretary General and Asian Society of Zoo and Wild Life Medicine: Dr. Kimmura Junpei; All the invite speakers comes from: Faculty of Medicine, Faculty of Veterinary Medicine and Tropical Disease Center of Universitas Airlangga, Feed Technology and Nutrition, Research Institute for Animal Production-Indonesia, College of Veterinary Medicine Murdoch University, Division of Molecular Medicine and medical Genetic, Department of Pathology, Kobe University, Universiti Putra Malaysia, Graduate School of Agricultural and life Sciences University of Tokyo Japan;

The honorable of all presenter and participants, also the sponsorships who are joint in the International Seminar with the themes:"The Role of Veterinary Science to Support Millennium Development Goals and the 12th Asian Association of Veterinary Schools Congress" during 2 days (5th-6th September 2013), which is Faculty of Veterinary Medicine of Universitas Airlangga as the hosted of the event.

Ladies and Gentlemen,

About 193 United Nation member states and at least 23 international organizations declared Millennium Development Goals (MDGs), and they have agreed to achieve the nine MDGs such as: eradicating extreme poverty and hunger, universal primary education, promoting gender quality, and empowering women, reducing child mortality rates, improving maternal health, combating HIV /AIDS, malaria and other diseases, ensuring environmental sustainability, and developing a global partnership for development.
Animal diseases which form an epizootic (Aphtha epizootic, mad cows diseases) and or zoonotic like Avian Flu, SARS (Severe Acute Respiratory Syndrome), Salmonellosis, Brucellosis, tuberculosis, rabies are threat to global security warned by Director General of the Word Organization as well as World Animal Health Organization (OIE). These diseases have potentially disastrous consequences if it’s not eliminated at their primary source. As we know that about systemic review of 1,415 pathogens are known about 61% infects humans.

To combat and fighting zoonosis diseases, Indonesia has launching the National Commission of Zoonosis Control under Coordinator Minister for people’s Welfare Republic of Indonesia.

So, the Veterinary Medicine Schools in Asian country has responsibility to provide some courses in the curricula to achieve Day one competencies. Four pillars could be strengthening by Veterinary School such as: education system, research, public extension and or services, and collaborations. The quality assurance should be guaranteed by each Veterinary Schools. In the event of AAVS congress programs to produce and launch the Logo of AAVS, and the consequence to be added the logo profile and philosophy in AAVS by Law. The other program is to perform Veterinary school curricula and gap analysis. Therefore, Veterinary school curricula in Asian country could be standardized.

On behalf Organizing Committee, I would like to say thank you to Director Research and Public Community Services Board of Directorate General of Higher Education, Ministry Education and Culture Republic of Indonesia, The OIE SRR SEA, Faculty of Veterinary Medicine Universitas Airlangga, IVSA, and the sponsorships from veterinary industries for supporting finance that the event become perform by successfully.

Ladies and Gentlemen,

Again, I would like to say thank you for your participative to the event, and please follow and enjoy the programs as well as your visit in Surabaya by happiness.

Billahi taufik wal hidayah, Wassalamu’alaikum warohmatullahi wa barokatu.
REMARKS OF RECTOR OF UNIVERSITAS AIRLANGGA
Prof. Dr. H. Fasich, Apt.

Assalamu'alaikum Warahmatullahi Wabarakaatu

First of all, let us pray to Allah SWT that because of His blessings we are able to be here in this very important event.

Secondly, I would like to say to all participants: Welcome to Surabaya, East Java, Indonesia! It is indeed a great honour for me to have the opportunity to be among the participants of this very special occasion, where all of us are going to have in-depth discussion about a very important and interesting topic closely related to veterinary science and the millennium development goals as a way to increase the quality of human health.

Indonesia's Millennium Development Goals (MDGs) are based on the eight international development goals that were officially established following the Millennium Summit of the United Nations in 2000, one of touches on the effort to combat wide-spread diseases such as HIV/AIDS and diseases transmitted by animals such as malaria, avian flu, swine flu, and so forth, which could be a serious threat to global security and human development.

Therefore, concerns over these MDGs from the point of view of veterinary science, especially among the researchers, have to be raised these day. There are numerous recent for conducting scientific research and other scientific activities to bring the MDGs to a success.

In this very special event, I would like to express my deepest appreciation to all members Asian Association of Veterinary Schools for their success in conducting better and better collaborations. Such collaborations are a pre-requisite for all efforts in improving performances, including the standardization of veterinary curricula in the ASEAN region and among Asian countries, in controlling the spread of zoonosis, and in developing and improving bio safety, bio security, surveillance, animal health and animal production.

I strongly believe and hope that this seminar and congress will be able to strengthen the existing networks that occurred among all the members of the association, as the main step in the eradication and prevention of infectious diseases, especially once that are related to animals, to support the Millennium Development Goals.

To all participants, I would like to thank you very much for coming to this forum. And to the organizing committee, I would like to give my sincerest appreciation for their wonderful job and hardwork in organizing this event.

I hope the seminar and the congress will be fruitful to all of use and lastly, please enjoy your stay in Surabaya.

Thank you very much,

Wassalammu'alaikum warahmatullahi Wabarakaatu.
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ABSTRACT

The purpose of this study was to compare the effect of milking procedure on milk quality and udder health of Etawah Crossbred goat. The study was conducted in the farmer group in the village of Samigaluk Kulon Progo. Twelve lactating goats were divided into Control and Treated groups. Milking goats of the Control group was conducted in the pen without teat dipping while for those in the Treated group in the milking stand followed with teat dipping. Sample was taken after milking in the morning. Examination was conducted to evaluate the milk taste and smell and to measure acidity, pH, total plate count (TPC) and somatic cell count (SCC). The result showed that pH and acidity of milk in the Control group was significantly lower than that in the Treated group (P< 0.05). Treatment could reduce milk taste (sour and bitter) and odor (smell prengus) but no effect on TPC and SCC. Teat dipping reduced SCC. The study concluded that good milking practiced by using milking stand combined with teat dipping improved milk quality and udder health of goats.

Key words: milking, goat, milk quality, udder health

INTRODUCTION

Goat farming potentially contributed to income source through production and commercialization of milk. Goat milk, although small quantity, provides high nutrient and easily to digest, therefore useful for health. In Java goat milk was majority produced by farmers under traditional management. In this situation, milking was conducted often in poor sanitation. Consequently milk was odorous as a result of contamination (from feces, urine or remain feed). This practical milking was also stimulate mastitis, which could be an important factor limiting milk production.

According to Scruton et al. (2006) in order to produce high quality milk, attention needs to be focused on sanitation details. Milking practice have a big impact on milk quality and udder health. The goat milk standard was 1.0 million somatic cells/ml and the cow milk standard was lowered to 750,000 cells/ml. Healthy, non-mastitic goats could produce milk with a somatic cell count of 1.0 million cells/ml and experience no decrease in yield and no change in components or quality. According to Park (2011) pasteurization and protection from sunlight or UV light control oxidized and "goaty" flavors. Goaty flavor is attributable to caproic, caprylic, and capric acids, which are present at high levels in goat milk fat and subject to release from fat globule membranes by lipases if improper milking and processing.

Ndewa et al. (2000) reported poor milking hygiene has caused mastitis infection in goats. Several agents caused mastitis in dairy goat were bacteria, mycoplasma and yeast pathogens. There were also several risk factors such as milking hygiene, management practice, feeding, number of days not lactating, number of lactation days and geographical locality might influence the type and the frequency of isolation of organisms causing mastitis. According to Sinn and Stultz (2005) properly milking dairy goat needed number of equipment included milking stand, milk bucket, cups, clean cloth, teat dip, soap and water.

Hedrich et al. (2008) recommended to apply pre and post dipping in milking goats. Pre-dipping used 0.5% iodine or other approved product and should cover about 3/4 of the teat for 30 seconds. Effective pre-dipping
reduced bacterial counts in milk by 5 to 6 fold. The purpose of the post dipping was to reduce the bacteria found in the milk and on the teat skin. This was also a fundamental aspect of the control of contagious mastitis. Schmidt et al. (1984) showed that teat dipping during lactation can reduce the incidence of new intra mammary infection.

For food safety reasons there was need to evaluate quality and hygiene of milk, avoid it from pathogenic bacteria so that ensure people to consume goat milk. The aim of the study was to investigate whether implementation of good milking procedure has positive effect on milk quality and udder health of goat or not. The effect was focused on the hygiene, including cleanliness, total bacteria, somatic cell count, organoleptic and chemical character of milk (pH and acidity).

**MATERIAL AND METHOD**

The study was conducted between September to November 2012 in the farmers group of Samigaluh, Kulon Progo, Yogyakarta. The climate is typical of mountaneous region, with temperature between 20-25 °C. Twelve lactating Etawah Crossbred goats at 2 to 3 months after kidding were placed individually in the raised floor goat pens and divided into Control and Treated groups. Goat feed consisted of grass, *Caliandra calothyrsus* wheat polars and soy bean hull. The goats in Control group were milked inside the pen and no teat dipping, while for those in the Treated group milking was conducted outside of the pen using milking stand. Teat dipping was applied after milking with Iodine 0.5%. Prior to milking the goats in both groups received the same treatments, including udder washing and drying with clean cloth. The first streams of fore milk from each teat was examined for any abnormalities and followed by CMT examination to identify the existence of subclinical mastitis. The result of CMT test was scored based on viscosity of milk sample after it was added with CMT reagent. The score ranged from (-), trace, (1+), (2+) and (3+). Those score indicated non infected, possible to be infected, low infected, infected and strongly infected, respectively. The sign of each score was no clot for (-), temporary clot and liquid (trace), coagulated but no formation of gel (+1), coagulated and formed gel (+2) and viscous gel (+3).

After discarded the first stream, milk was aseptically collected from the whole mammary gland, and then stored into sterile bottle and transported at 4°C to the laboratory for total plate count (TPC) and somatic cell count (SCC) test. The rest of milk was used for examination of cleanses, organoleptic (smell, flavor, taste and color), pH, acidity and specific gravity. The score for smell ranged from the lowest (1), middle (2) and strong (3). Milk taste varied from bitter (1), sweet (2), salty (3), sour (4) and rancid (5). All goat were fed forage and concentrate at the level of 4% of body weight in dry matter. Data were statistically analysed with t-test. Data concerning organoleptic test were analysed using non parametric.

**RESULT AND DISCUSSION**

The result of visual examination showed no abnormalities milk. Table 1 presented the quality of goat milk during the study. The average pH of milk from Control goats was significantly lower than in Treated group (P<0.05). Low pH (5.11 ± 2.78) reflected the existence of bacteria and presumably milk has contaminated. According to Buckle et al. (1987) lactate producing bacteria could decrease pH to around 4.0. In this study milk from Treated group attained standard of pH which was required by SNI (2011) at 6.3 to 6.8. This data suggested to consider the importance of environment hygiene during milking, such as by putting the goat in the milking stand. Milk acidity in this study considered to be high (0.017 to 0.020%). Based on the acidity level, contamination possibly has occurred in
milk of both Control and Treated group. There was also possibility of the effect of milk component. According to Saleh (2004) acidity indicated the level of handling and storage time. The acidity was also caused by citrat, amino acid and CO₂ diluted in milk.

The total plate counts (TPC) in milk from Treated goat (8.35 log CFU/ml) was less than that in Control (10.21 log CFU/ml) but the difference was not significant. Suguna et al. (2012) cited from Cempirkova (2002) and Zweifel et al. (2005) presented that total bacterial count in goat milk was allowed up to 5.0 log CFU/ml with somatic cell count of 6.0 log CFU/ml. Although in general milk in this study contained high number of total bacteria incompared with the standard requirement but the treatment tended to reduce it. Therefore from the point of hygiene, the utilization of milking stand and dipping was considerably useful to improve milk quality. The effort of improving hygienic condition during milking was important because goat milk could easily contaminated and spoiled due to poor hygienic conditions. Proper milking become part of important on farm level activities to ensure milk quality. According to Sinn and Stultz (2005) properly milking dairy goat needed number of equipment included milking stand, milk bucket, cups, clean cloth, teat dip, soap and water. Milking stand in this study was cheap and easily prepared using remain wood which available around the farmers location. This equipment was also useful to avoid odorus so that improved taste and lead more consumer to prefer goat milk.

Table 2 showed the score of CMT test. In the Treated group was found more negative score than those in Control. This data indicated that proper milking procedure produced hygiene milk.

Gray and Schalm (1966) stated the the interpretation of the C.M.T scores of 1+, 2+, and 3+ were indicative of mastitis and high leucocyte counts in milk from one or more quarters. This study showed that the utilization of milking stand reduced CMT score. More negative score corresponded to low leucocyt number. This also indicated less possibility of mastitis attacked in the udder. The result was similar to the finding of SCC number, presented in Table 1. According to O’Brien et al. (2009) milk SCC is a key component of national and international regulation for milk quality and an indicator of udder health and of the prevalence of clinical and subclinical mastitis in dairy herds. The number of SCC in Treated goats in this study was less than those in Control group. This data indicated a positive effect of properly milking process whih conducted by using milking stand and teat dipping. Similarly, Purwantiningsih (2012) reported the improvement of CMT test as a result of teat dipping using Morinda citrifolia. According to Hédrich et al. (2008) pre and post dipping in milking goats was effective to reduce bacterial counts. The purpose of the post dipping was to reduce the bacteria found in the milk and on the teat skin and also control of contagious mastitis.

The important finding of this study was shown by reducing of goaty smell of milk. Panelis more frequent stated no goaty smell and no sour, salty and bitter taste of milk from the Treated group incompared with those in Control. The existence of goaty smell was part of goat milk characters but that could be reduced because of the possibility low preference of consumers to this smell. The low goaty smell beneficial to promote goat milk consumption. Less intensity of sour, salty and bitter taste indicated that milk was in the range of normal organoleptic standrat. This characters were expected in hygienic and good flavor of goat milk to ensure consumer.
Table 1. Milk quality of goats during the study

<table>
<thead>
<tr>
<th>Variables</th>
<th>Control</th>
<th>Treated</th>
</tr>
</thead>
<tbody>
<tr>
<td>pH</td>
<td>5.11 ± 2.78&lt;sup&gt;a&lt;/sup&gt;</td>
<td>6.38 ± 1.30&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Acidity (%)</td>
<td>0.017 ± 0.010&lt;sup&gt;a&lt;/sup&gt;</td>
<td>0.020 ± 0.006&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>TPC (log CFU/ml)&lt;sup&gt;ns&lt;/sup&gt;</td>
<td>10.21 ± 1.70</td>
<td>8.35 ± 0.95</td>
</tr>
<tr>
<td>SCC (cell/ml)</td>
<td>3.50 × 10&lt;sup&gt;s&lt;/sup&gt; ± 2.12 × 10&lt;sup&gt;s&lt;/sup&gt;</td>
<td>2.36 × 10&lt;sup&gt;s&lt;/sup&gt; ± 1.00 × 10&lt;sup&gt;s&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>ns</sup> non significant  <sup>a,b</sup> means within row with different superscripts were significantly different at P<0.05

Table 2. CMT test result of goat milk at the beginning of treatment

<table>
<thead>
<tr>
<th>Group</th>
<th>Replication</th>
<th>Left teat</th>
<th>CMT test score</th>
<th>Right teat</th>
</tr>
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<tbody>
<tr>
<td>Control</td>
<td>1</td>
<td>(-)</td>
<td>(++)</td>
<td>(++)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>(+++)</td>
<td>(+)</td>
<td>(++)</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>(-)</td>
<td>(-)</td>
<td>(-)</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>(+++)</td>
<td>(++)</td>
<td>(++)</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>(++++)</td>
<td>(+++)</td>
<td>(++)</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>(++++)</td>
<td>(++)</td>
<td>(++)</td>
</tr>
<tr>
<td>Treated</td>
<td>1</td>
<td>(-)</td>
<td>(-)</td>
<td>(-)</td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>(-)</td>
<td>(-)</td>
<td>(-)</td>
</tr>
<tr>
<td></td>
<td>3</td>
<td>(-)</td>
<td>(-)</td>
<td>(-)</td>
</tr>
<tr>
<td></td>
<td>4</td>
<td>(-)</td>
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<tr>
<td></td>
<td>5</td>
<td>(+)</td>
<td>(+)</td>
<td>(+)</td>
</tr>
<tr>
<td></td>
<td>6</td>
<td>(-)</td>
<td>(-)</td>
<td>(-)</td>
</tr>
</tbody>
</table>

Table 3. The result of organoleptic test of goat milk

<table>
<thead>
<tr>
<th>Variables</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control</td>
<td>Treated</td>
</tr>
<tr>
<td>No goaty smell (prengus)</td>
<td>11</td>
<td>26</td>
</tr>
<tr>
<td>Midle</td>
<td>12</td>
<td>1</td>
</tr>
<tr>
<td>Goaty smell (prengus)</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>Taste</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>Not sweet</td>
<td>15</td>
<td>26</td>
</tr>
<tr>
<td>Not sour</td>
<td>15</td>
<td>19</td>
</tr>
<tr>
<td>Not salty</td>
<td>15</td>
<td>26</td>
</tr>
</tbody>
</table>

CONCLUSION

Improving milking procedure, by milking stand utilisation and teat dipping showed positive effects of on the quality and udder health of goat. The effect was proved by normal pH, lower SCC, better CMT score, less goaty smell and good organoleptic score of milk.

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REFERENCE


111
CERTIFICATE OF ATTENDANCE

This is to certify that

Nurliyani

AS SPEAKER

in INTERNATIONAL SEMINAR
THE ROLE OF VETERINARY SCIENCE
TO SUPPORT MILLENNIUM DEVELOPMENT GOALS

was held in JW Marriott Hotel Surabaya - Indonesia
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