THE ASIAN - AUSTRALASIAN

AAAP

ASSOCIATION OF ANIMAL PRODUCTION SOCIETIES

Prof. Dr. Ir. Tuty L. Yusnaf, MS

Sustainable Livestock Production in the Perspective of
Food Security, Policy, Genetic Resources, and Climate Change

22

Proceedings
Vol. II Abstracts

10-14 November 2014, Yogyakarta, INDONESIA

aaap

The 16th AAAP Congress

The 16th AAAP Congress

Ministry of Agriculture

ISPI
IKATAN SARJANA PETERNAKAN INDONESIA

Indonesian Society of Animal Sciences

Gadjah Mada University

SUSTAINABLE LIVESTOCK PRODUCTION IN THE PRESPECTIVE OF FOOD SECURITY, POLICY, GENETIC RESOURCES, AND CLIMATE CHANGE

PROCEEDINGS

VOL. II ABSTRACTS

Editors:

Subandriyo
Kusmartono
Krishna Agung Santosa
Edi Kurnianto
Agung Purnomoadi
Akhmad Sodiq
Komang G. Wiryawan
Siti Darodjah
Ismeth Inounu
Darmono
Atien Priyanti
Peter Wynn
Jian Lin Han
Jih Tay-Hsu
Zulkifli Idrus

The 16th AAAP Congress

Cataloguing-in-Publication Data

The 16th Asian-Australasian Associations of Animal Production Socities

Proceedings Vol. II Abstracts

Sustainable Livestock Production in the Perspective of

Food Security, Policy, Genetic Resources, and Climate Change

10-14 November 2014, Yogyakarta, Indonesia / editors Subandriyo *et al*;

856 p: ill.; 21 x 29,7 cm

Organized by Indonesian Society of Animal Sciences

In Collaboration with Ministry of Agriculture

Faculty of Animal Sciences Universitas Gadjah Mada

ISBN 978-602-8475-87-7

1. Livestock 2. Food Security 3. Policy

4. Genetic Resources 5. Climate Change

I. Title II. Subandriyo

AAAP

Asian-Australasian Association of Animal Production Societies

✧ **Scope of AAAP**: AAAP is established to devote for the efficient animal production in the Asian-Australasian region through national, regional, international cooperation and academic conferences.

✧ **Brief History of AAAP**: AAAP was founded in 1980 with 8 charter members representing 8 countries-those are Australia, Indonesia, Japan, Korea, Malaysia, New Zealand, Philippines and Thailand. Then, the society representing Taiwan joined AAAP in 1982 followed by Bangladesh in 1987, Papua New Guinea in 1990, India and Vietnam in 1992, Mongolia, Nepal and Pakistan in 1994, Iran in 2002, Sri Lanka and China in 2006 , thereafter currently 19 members.

✧ **Major Activities of AAAP**: Biennial AAAP Animal Science Congress, Publications of the Asian-Australasian Journal of Animal Sciences and proceedings of the AAAP congress and symposia and Acknowledgement awards for the contribution of AAAP scientists.

✧ **Organization of AAAP**:

· President: Recommended by the national society hosting the next biennial AAAP Animal Science Congress and approved by Council meeting and serve 2 years.
· Two Vice Presidents: One represents the present host society and the other represents next host society of the very next AAAP Animal Science Congress.
· Secretary General: All managerial works for AAAP with 6 years term by approval by the council
· Council Members: AAAP president, vice presidents, secretary general and each presidents or representative of each member society are members of the council. The council decides congress venue and many important agenda of AAAP

✧ **Office of AAAP:** Decided by the council to have the permanent office of AAAP in Korea. Currently # 909 Korea Sci &Tech Center Seoul 135-703, Korea

✧ **Official Journal of AAAP**: Asian-Australasian Journal of Animal Sciences (Asian-Aust. J. Anim. Sci. ISSN 1011-2367. http://www.ajas.info) is published monthly with its main office in Korea

✧ **Current 19 Member Societies of AAAP:**
ASAP(Australia), **BAHA**(Bangladesh), **CAASVM**(China), **IAAP**(India), **ISAS**(Indonesia), **IAAS**(Iran), **JSAS**(Japan), **KSAST**(Korea), **MSAP**(Malaysia), **MLSBA**(Mongolia), **NASA**(Nepal), **NZSAP**(New Zealand), **PAHA**(Pakistan), **PNGSA**(Papua New Guinea), **PSAS**(Philippines), **SLAAP**(Sri Lanka), **CSAS**(Taiwan), **AHAT**(Thailand), **AHAV**(Vietnam).

✧ **Previous Venues of AAAP Animal Science Congress and AAAP Presidents**

I	1980	Malaysia	S. Jalaludin	II	1982	Philippines	V. G. Arganosa
III	1985	Korea	In Kyu Han	IV	1987	New Zealand	A. R. Sykes
V	1990	Taiwan	T. P. Yeh	VI	1992	Thailand	C. Chantalakhana
VII	1994	Indonesia	E. Soetirto	VIII	1996	Japan	T. Morichi
IX	2000	Australia	J. Ternouth	X	2002	India	P. N. Bhat
XI	2004	Malaysia	Z. A. Jelan	XII	2006	Korea	I. K. Paik
XIII	2008	Vietnam	N.V. Thien	XIV	2010	Taiwan	L.C. Hsia
XV	2012	Thailand	C.Kittayachaweng	XVI	2014	Indonesia	Yudi.Guntara.Noor

- AAAP is the equal opportunity organization
-

Remark from Chairman of the 16th AAAP Congress

Dear all of the scientists, delegates, participants, ladies and gentlemen,

As the host of the 16th AAAP Animal Science Congress, we do impress, thankful, and present a high appreciation for your participation in joining the 16th AAAP Conference in Yogyakarta, Indonesia. We can see the very great enthusiasm of all the scientists to solve livestock problems as well as to share valuable information and knowledge for human prosperity all over the world.

A large numbers of representatives are participating in this conference, which indicates that the interest in the field of animal science is continuously increasing among member countries. We have invited some Plenary Speakers and Invited Papers who are qualified as scientists and bureaucrats in animal science field to share their valuable information and knowledge. Other participants can deliver their precious research through oral and poster presentations. This congress is also paralleled to symposium held by livestock organization and institution as well as some academic meetings.

The theme of the 16th AAAP Congress is "Sustainable Livestock Production in the perspective of Food security, Policy, Genetic Resources and Climate Change". We believe that animal production in Asia and Australasia has become important and strategic sector to provide high quality food, opening up job opportunities, as well as improving farmer's welfare. Animal science socities, therefore, have to support this growing interest by providing more appropriate and relevant technologies to improve efficiency of resources utilization to produce more animal protein food by member countries. Long term sustainable livestock production will, therefore, be significantly influenced by the national food policy, climate change issues, as well as conserved environments and genetic resources.

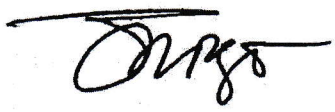
On behalf of 16th AAAP Committee and all associates, we wish all of the participants having a great achievement of success and fulfill the expectation as well as enjoying the interaction with all scientists participating the Congress.

High appreciation we may acknowledge to all of sectors, especially for His Majesty of Royal Palace of Yogyakarta, Sri Sultan Hamengku Buwono X, and Rector of Universitas Gadjah Mada, who have concerned to facilitate the Congress site host. Special thank to the Steering Committee, Scientific Committee, Reviewers and Editorial Boards for their great contribution to make the Congress successfully organized.

To you, your excellencies, invited guests and delegates, thank you for choosing to come to this conference and to Indonesia. We hope the arrangements we have put in place meet with your requirements. We wish you fruitful deliberations and an intellectually and socially rewarding stay in Yogyakarta.

We are looking forward to meeting you all in the future congress to continue.

Terimakasih (Thank you)



Budi Guntoro

Chairman of the 16th AAAP Congress

16th AAAP PRESIDENT'S REPORT

Selamat pagi!

Dear Ladies and Gentleman

Attendants of 16 AAAP congress:

It is my great pleasure and honor to welcome all of you at The 16th AAAP Congress on November 10 – 14, 2014 at Grha Sabha Pramana, Universitas Gadjah Mada, Yogyakarta Indonesia. This Congress is jointly organized by The Indonesian Society of Animal Science (ISAS), Indonesian Agency for Agricultural Research and Development, Indonesian Directorate General of Livestock and Animal Health Services-Ministry of Agriculture and Faculty of Animal Science Universitas Gadjah Mada. Universitas Gadjah Mada Campus is located in Yogyakarta, one of the Special Region in Indonesia where culture and tradition live in harmony with the modern nuance and educational spirit makes it a beautiful venue of this Congress.

The 16th AAAP Program consists of scientific and technical programs as well as social and cultural activities. The scientific and technical programs offer five plenary sessions, two satellite symposia, field trip, and many scientific sessions, both oral and poster presentations.

During this event distinguished scientists from all over the world will present plenary papers ranging from livestock policy, food security, local genetic resources, climate change, animal welfare, international trade, as well as global research agenda. I believe that around 1,200 scientists as well as livestock producers, companies, graduate and postgraduate students from 40 countries are attending the Congress and more than 770 research papers will be presented. The Congress also provides not only opportunities to discuss and exchange information and experience with scientists from different regions of the world, but also a good environment to build up friendship between nations is our ultimate goals for the Congress outcome. Moreover, this congress also keeps its tradition to be a forum of communication among researchers, academician, industries and related stakeholders among Asian-Australasian countries.

The social and cultural programs are specially desgined to be very important for the congress participants since the promotion of friendship and future scientific cooperation are also central to this AAAP Congress. The Opening Ceremony will offer you the Congress Program at a glance. In addition, participants will also join at a warm Welcome Dinner gathering at Keraton Yogyakarta. Sri Sultan Hamengku Buwono X, His Majesty of The Royal Palace of Yogyakarta will give you the most memorable moment during this event.

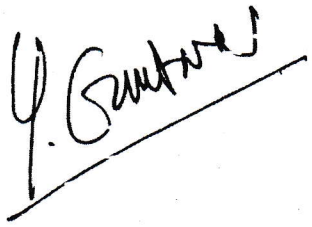
Moreover, cultural night offers us an opportunity to introduce significant culture from participants' countries and gives a spectacular performance to enjoy in order to strengthen our friendship and future cooperation. Field trip, on the other hand, provides a wonderful sightseeing to the most valuable ancient heritage around Yogyakarta, such as Borobudur and Prambanan Temples, and more other interesting places to visit. I do hope that you enjoy your stay in Yogyakarta and not miss all of these spectacular opportunities.

Closing Ceremony will be held on November 14, 2014 immediately after the last session of presentation. During this great moment we will welcome the next host of the 17th AAAP Congress to deliver a brief message. The AAAP Congress Award will provide and announce some participant who receive appreciation for their valuable research.

With all of our hospitability, we will try our best to make your brief visit to Yogyakarta and our beautiful country Indonesia, become a wonderful experience and memorable moments.

I wish you all a very pleasant and most enjoyable stay in Yogyakarta, Indonesia.

Terima kasih (Thank you).



Sincerely Yours
Mr. Yudi Guntara Noor
President
The 16th AAAP Congress

PREFACE

The proceedings of the 16th Congress of the Asian-Australasian Association of Animal Production Societies (AAAP) held on 10-14 November 2014 at Grha Sabha Pramana, Universitas Gadjah Mada, Yogyakarta, Indonesia, consist of two volumes. Those are Volume I of Plenary and Invited Papers and Volume II of Abstracts Contributed Papers. This is the second volume of the proceedings that contains a total of 754 abstracts, consist of 368 papers for oral presentation and 386 papers for poster. Papers were categorized into various disciplines, such as Nutrition and Feed Technology; Genetics and Reproduction; Physiology, Animal Welfare and Health Management; Product Technology and Food Safety; Waste and Environmental issues; Forage Agrostology; as well as Agribusiness, Marketing, Extension and Community Development. The scientific committee has initially received a total of 1,028 abstracts from 42 countries. After reviews have been made, 60 of them were rejected and 74 were cancelled by the authors. The reviewers consist of 4 international and 71 internal reviewers from 6 universities and 1 research institute in Indonesia. In the interest of time limitation for proceedings publication, we apologize for not including 140 submitted abstracts in the proceedings since they were not being followed up with full manuscripts until the extended due date we offered.

The scientific committee would like to thank all the reviewers and appreciate their effort to make significant contribution in reviewing the full manuscripts. Similarly, we would also like to thank supporting staffs at the secretariat office of the Faculty of Animal Science, Universitas Gadjah Mada as well as of the Indonesian Center for Animal Research and Development who have helped in the preparation of the proceedings. Finally, we would like to thank all the authors for their valuable contribution to the congress and make it useful for our societies.

Editorial Team

The Relationship of Vaginal Cytology Analysis with Estrous Signs to the Success of Artificial Insemination in Dogs

Tuty L. Yusuf
Clinics Department, Reproduction and Pathology, Faculty of Veterinary Science, Bogor Agricultural University, Bogor, Indonesia
Corresponding email: omanya_kyne@yahoo.com

ABSTRACT

Artificial Insemination (AI) in dog is used to improve genetic quality and ~~the~~ breeding success. Natural mating is usually conducted based on estrous sign after the first vulva discharge (9-12 days) recognized, however the conception rate was low. Fresh semen has more advantages compare to frozen and liquid semen due to the best sperm quality could be used for AI immediately. Twenty one pair dogs from different breed were used for this study. The estrous status of bitches was analyzed through vagynal cytology to predict optimal mating time based on number of superficial cells/cornified dominant. Estrous intensity divided into good and fair quality according to the degree of the bloody discharge, vulva mucous changes and "mating position" response. Semen collection was conducted using penile massage technique. Then fresh semen that have > $80x10^6$ sperm/ml in concentration and sperm motility > 60% was used for AI. Each bitch received two times of AI with fresh semen at day 10^{th} and 12^{th}. The resul showed 15 out of 21 bitches (71.4%) were on day 6^{th}-$8^{th}$with the ratio of superficial cells and intermediate cells about 50:50 to 60-40. Four bitches on day $9^{th}$with the majority of cornified cells. Furthermore observation in estrous intensity showed that 10 dogs have good intensity and the other 11 dogs having fair status. The success rate of AI was indicated that 15 out of 21 dogs (71.4%) have pregnant diagnosed through USG examination one month after and 6 dogs failed to pregnant. It could be concluded that vaginal cytology analyzed can be used to predict optimal mating time correlated with estrous intensity degree (vulva sign and "mating position") for success rate of AI in dog.

Key Words: Vagynal cytology, Estrous intensity, Optimal mating time, Fresh semen Artificial Insemination, Dog breed.

INTRODUCTION

Artificial Insemination (AI) has been performed in dogs to help those having difficulties in natural mating, or to improve the litter's genetic. In Indonesia, typically the purebred dogs have been mated by counting the days of the heat cycle, when estrous was clinically recognized by the presence of bloody discharge oozed out from the vulva; however,many owners reported that this method had been inefficient, particularly when the bitch failed to conceive. Such of failure was believed due to an inappropriate mating time or a poor semen quality.

AI is commonly performed by using fresh (unextended) semen, fresh-chilled extended semen or frozen semen. AI using fresh semen is particularly important for an owner having own bitch and stud dogs. Successful mating in dogs is greatly influenced by the quality of spermatozoa, estrous intensity, and appropriate mating time.

On average, the estrous of a female dog lasts 16-17 days, consisting of proestrous at 6-9 days and the estrous which may lasts 3-5 days, with a diestrous of roughly 40-50 days (Valerie et al., 2003). Vaginal cytology is a valuable method to determine an appropriate mating time by evaluating the cell types of the vaginal smear. The profile of superficial cells and cornified cells is commonly used to determine the appropriate mating time. In general, estrous is

recognized when the female exhibits sexually receptive behaviour to accept mating; however, in fact, individual variation may yield a different mating time.

AI is usually performed by fresh semen collection, followed by macroscopic as well as microscopic assessment of thesemen. When the semen has the expected quality, it is inserted into the utero-vaginal junction by using AI catheter. This study demonstrated the result of artificial insemination of dog patients which were presented to the clinic for reproductive problems. Artificial insemination using fresh semen collection, along with semen assessment and vaginal cytology, with the correlation of estrous clinical signs were expected to ensure a successful pregnancy.

MATERIAL AND METHODS

Total of 21 pairs of purebred dogs were involved in this study: 2 pairs of Chow chow, a pair of beagles, 2 pairs of Shih Tzu, 2 pairs of Rottweiler, 2 pairs of Golden retriever, a pair of samoyed, 10 pairs of pomeranians, and a pair of Siberian husky. Vaginal cytology, swelling of the vulva, presence of bloody vaginal discharge and sexually receptive behaviour to accept mating were used to determine the appropriate mating time of the bitch in each pair. Vaginal smears were stained with Giemsa to evaluate the type of vaginal cells; this result was combined with the bitch and stud dogs' behaviour.

Semen samples were collected using manual massage behind bulbus glandis, and the estrous teaser bitch. Semen was collected in two different tubes for each fraction: (1) the initial or slightly cloudy pre-sperm fraction and (2) the sperm-rich fraction; the post-sperm or clear fraction was not collected. Every rich-sperm fraction of semen sample was macroscopically evaluated for the color and volume, and also be evaluated microscopically for the spermatozoa motility percentage and sperm concentration by subjective estimation. The sperm rich fraction was cloudy to milky white in color. The volume of semen was varied, depending on the size of the dogs. The semen volume of medium sized dogs (Chow chow, Beagle, Rottweiler, Golden retriever, Samoyed) ranged from 3 to 5 ml, while the semen volume of small breed dogs (Pomeranian, Shih tzu) ranged from 1 to 1,5 ml.

AI was done only when the semen color was cloudy to miky white, and the sperm concentration was estimated to be more than $80x10^6$ sperm/ml with sperm motility was more than 60%. The bitch was inseminated on days 10, 12, and 14 after the onset of estrous signs. Prior to insemination, a cytological evaluation of the vaginal smear was done to identify the presence of late superficial cells and cornified cells. After the vulva was being cleaned, the collected rich sperm fraction of the semen was inserted into the vagina by using an AI cathether which had been connected to a 5 ml syringe.

Determination of perfect mating time on a bitch was done by evaluating the vaginal smears using the following criteria:

- Parabasal cells and intermediate cells were more than 70% and 30% in superficial cells; within day 3 – 5 of heat
- Intermediate cells and superficial cells were about equal in numbers (50 : 50 ratio): within day 6-7 of heat
- Intermediate cells to superficial cells ratio was 30 : 70: within day 7-8 of estrous
- Superficial cells were more than 70%: day 9 - 11 of heat (many cornified cells)

Estimation of mating time by the presence of receptive to "mating position" of the bitch when the vulva was stimulated:

- Positive response, as seen by flagging tail with elevation of the vulva: day 6-8 of heat
- Negative (none to minimal) response: day 1-5 of heat

Semen collection was done manually: Preputium and penis were cleaned by using normal saline solution. Fingers of inseminator were locked in a ring around the penis to essentially holding the bulbis glandis inside the inseminator's fist. Gentle pressure was applied with forward and backward movement to ensure a continuous massage. Full erection occurred when the bulbus glandis was enlarged and engorged with blood. Following the erection signs, the pre-sperm fraction was collected in a tube. A different tube was used to collect the rich-sperm fraction of the semen until the collection was stopped when post sperm fraction was recognized.

Each rich-sperm fraction of the semen samples was evaluated macroscopically and microscopically for Volume (ml) and Sperm motility (%) by subjective estimation on a few drops of semen fraction on a clean glass slides, which was covered by a coverslip.

Sperm concentration evaluated by subjective estimation on a few drops of semen fraction on a clean glass slides, which was covered by a coverslip ($10x10^6$).

Semen samples to use for AI were at least had the concentration of $>80x10^6$ spermatozoa/ml with > 60% sperm motility and < 10% of sperm abnormality.

RESULT AND DISCUSSION

An owner usually came to animal clinic when their dog had bloody discharge from its vulva; most experienced ownerspresented their dog to the clinic at day 6 to 7 after the sign of blood discharge. Some of the dogs, especially Pomeranian,were not presented with bloody discharge from the vulva, but they had swollen vulva and displayed sexually receptive behaviour.

Based on the vaginal cellular pictures, fifteen out of twenty one dogs (74.7%) were estimated at day 6 to 8 of estrous; four dogs were at day 9 and two dogs were at day 10-11 of estrous.

Estrous intensity of the dogs was determined from clinical signs, bloody discharge from the vulva and vagynal cellular pictures. Ten dogs (47.62%) consisting of 6 Pomeranians, 2 Shihtzus, 1 Samoyed and 1 Siberian Husky had good intensity; while 11 dogs (52.38%) consisting of 4 Pomeranians, 2 Golden Retrievers, 2 Chow-chows and 1 Beagle had fair estrous intensity. The differences on estrous intensity among the dogs were commonly related with the environment, nutrition and daily management (Kustritz, 2006).The nutrition quality influenced gonadotropin hormones production which had effects to follicle development as well as estrogen production. Estrogen concentration in blood influenced the estrous intensity.

The evaluation of rich sperm fraction of semen displayed differences in volume and concentration, which were related to the size of dogs. Pomeranians had 0.5 – 1 ml volume of semen, Shih Tzu had 1-1.5 ml volumen of semen, while Golden retriever, Rottweiller, and beagle had 3-4 ml volume of semen. The semen used in AI had sperm concentration at least $80x10^6$ sperm/ml with 60-75% of sperm motility. Normally the sperm concentration in dogs were ranging from 80 – 500 spermatozoa/ml (Romagnoli, 2002). The color of semen could be used to estimate the concentration, the more cloudy and milky in color usually had higher sperm concentration.

Table 1. Pregnancy Rate based on the day of estrous detected by vaginal cytology

Day of Estrous	Insemination (n)	Pregnancy Rate (n, %)
6-8	15	10 (66.7)
9	4	3 (75.0)
10-11	2	2 (100)

Pregnancy rate was diagnosed by using ultrasonography (USG) on the bitch one month after AI, which were artificially inseminated with fresh semen at day 10 and 12 of heat. Fifteen out

of twenty one dogs (71.43%) were pregnant and six dogs displayed a failure to conceive. Higher success rate was identified on those artificially inseminated at day 9 and 10-11 of heat (75-100%), than those artificially inseminated at day 6-8 of heat (66.7%) (Table1). Some factors may influence the success rate of pregnancy include the individual variation of estrous length. The prolonged estrous in dogs may causethe failure to conceive, because it is related with difficulty to predict the ovulation time. The other factor was the disturbances micro environment of uterus. In this case while the estrous can be seen in dogs and the fertilization was success but the implantation maybe failed. Usually in normal estrous in dogs, the ovulation have predicted at day 11 -12 from beginning of estrous (Valerie et al. 2003). The fertility of ovum in dogs is in 5-7 days long, so the different AI time is possible to make fertilization. A Chow-chow and a Golden which were failed to get pregnant had a prolonged estrous; the vaginal cellular profile in these dogs showed superficial and cornified cells on day 15 of estrous and the profile were persisten in this phase for a longer time.

CONCLUSION

The result of this study showed that the appropriate AI time in dogs using fresh semen could be done by using vaginal cellular profile to determine day 10 and 12 of heat. The optimal mating time from the vaginal cellular profile combined with the presence of sexually receptive behaviour, included swelling and hyperemia of mucous membrane of the vulva. The pregnancy rate in this studywas 70% in average, all were diagnosed by USG on the week 4 after the latest AI.

REFERENCES

Gropeti, D., A. Pecile, S. Arrighi, D. A. Giancimillo, F. Cremonesi. 2010. Endometrial cytology and computerized morphometric analysis of epitehial nuclei: A useful tool for reproductive diagnosis in the bitch. Theriogenology.WWW.theriojournal.com

Margaret, V., R. Kusritz. 2006. The dog breeder's guide to Successful Breeding and Health Management. Saunders Elsevier.

Romagnoli, S. 2002.Canine artificial insemination with fresh, refrigerated and frozen semen. Proceedings of the veterinary Sciences Congress, CPCV, Oiras. 10-12, pp 167-170

Valerie, R. B.,Tarpley H. L, Bain P. J, Latimer K. S. 2003. The Canine Estrous Cycle.Staging using vaginal cytological examination. http://vet.uga.edu/vpp/clerk/beimborn//