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## **Incidence of boar infertility problem in the farms using alternate mating system**

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### **Summary**

The objective of this investigation was to determine the incidence of infertile and/or subfertile boars in the breeding herd using alternate mating technique. The study was conducted in 3 commercial farms which had alternate mating system with average boar power of 1:20. A total of one hundred boars were subjected to 137 semen collections and evaluation in conjunction with breeding history. The examination was carried out weekly, boar with any abnormality was subjected to re-examination for another one or two occasions. Problem animals were identified by semen picture as subfertile and infertile 12.0 and 11.0% respectively. For confirmation, they were slaughtered and the testicles were examined both macroscopically and microscopically. Among the eleven infertile boars, 4, 6 and 1 possessed fibrotic testes, total bilateral testicular degeneration and epididymal dysfunction, respectively.

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The present findings indicated that alternate mating method may accumulate the defected boars. Therefore, it is suggested that individual boar semen should be evaluated before using the alternate mating method or a single boar mating method should be used in order to get rid of the problem boar.

### Introduction

During the last five years, pig breeders have applied the conventional method of mating the sows by alternation of mating. This method used different boars to serve the same sow. for example sow A is mated by boar X in the morning and one more in the evening by boar Y. By this method, the farmer expected to have an increased of conception rate of 3-8% and increases of 0.2 piglets/litter (Hurtgen, 1981). Using this method the farmer can not recognize problem boars which included infertile and subfertile in the herd. Because of the fertility checking could not be done after using such mating system. Therefore, individual boar semen examination for quality checking is necessary in order to evaluated or identify if any infertile or subfertile

boars are presented in the herd.

The purpose of this study was to determine the incidence of infertile and/or subfertile boars in the commercial herds which have been using the alternate mating system in Nakhon-Pathom area.

### Material and Methods

In this study 100 boars belonged to three commercial breeding herds in Nakhon-Pathom province were used, each herd ranged from 800 to 1200 sows. One hundred and thirty seven semen collections were performed from these boars (Table 1) and sent for evaluation at semen laboratory, Department of Obstetrics, Gynaecology and Reproduction, Veterinary Research and Training Center, Chulalongkorn University, Nakhon-Pathom.

**Table 1** Number of boars and collections of semen from 3 commercial breeding herds in Nakhom-Pathom province

Herd	No.of boar	No.of collection
1	30	42
2	34	45
3	36	50
TOTAL	100	137

The evaluation of semen was similar to the technique previously described by Lagerlof (1934). Briefly, it comprised of immediately after collection semen was examined in farm for motility, semen volume, density, and pH. While sperm concentration and sperm morphology were carried out in our laboratory. In case of high percentage of abnormal sperms, both primary and/or secondary abnormalities, the boar's semen was re-collected and evaluated again 1 week later and repeated one more time when it was not at the accepted level. While for the boars with good semen

quality they were collected on one time. After two or three repeated examinations of semen the boars were considered normal, infertile or subfertile boars. The criteria used for judging whether animals were subfertile or infertile were shown in Table 2. The establishment of these criteria was made according to the fertility checking by using the single mating system. After slaughtering, all reproductive organs were collected and examined macroscopically and microscopically. All data were recorded and kept for analysis.

Table 2 The investigation was carried out during spermiogram was used as criteria for judging whether animal was normal fertile, subfertile and infertile.

	Normal	Subfertile	Infertile
Volume (ml.)	>100	<100 or normal	<100 or normal
Density	milky	watery or milky	watery or milky
Motility (%)	60-100	<60	<10 or nil
Concentration (million/ejaculation)	>8,000-30.000	<8,000	<2,000 or nil
Normal sperm morphology (%)	>80	<60	<20

Table 3 Incidence of normal, subfertile and infertile boars in 3 commercial breeding herds. (n = 100),

Herd	Normal boars		Subfertile boars		Infertile boars	
	No.	%	No.	%	No.	%
1	26	86.6	2	6.7	2	6.7
2	24	70.6	6	17.6	4	11.8
3	27	75.0	4	11.1	5	13.9
TOTAL	77	77.0	12	12.0	11	11.0

## Results and Discussion

The results for the incidence of normal, subfertile and infertile boars are presented in Table 3.

Seventy-seven boars were considered normal spermiogram from the first semen collection and could be used for breeding. Four boars from this group possessed high percentage of abaxial (30-80%) but they were considered normal as the defect of abaxial has no effect to fertility in boar (Roberts, 1971). Twelve boars (12%) were considered as subfertile boars, some of them were slaughtered and postmortem examination including microscopic examination of the reproductive organs revealed that mild testicular degeneration was found mostly on both unilateral and bilateral testes. At the same time, some of the

subfertile animals were not slaughtered due to lack of replacement boars.

Eleven boars were considered infertile after three repeated examinations of the semen. Fertility checking by using natural mating, 4 sows were mated to each boar, the result obtained was return to oestrus in all sows. These boars were slaughtered and the macroscopic and microscopic examination of the reproductive organs revealed that the 4 boars had fibrotic testes which was in accordance with the semen picture of aspermia, six boars were considered as total bilateral testicular degeneration, and one boar had epididymal dysfunction. The distribution of the cases in each herd was presented in Table 4.

Table 4 Incidence of infertile boars in 3 commercial breeding herds. (n = 100)

Herd	Fibrotic testes	Testicular degeneration	Epididymal dysfunction
1	-	1	1
2	2	2	-
3	2	3	-
TOTAL	4	6	1

Several factors are considered to be the cause of infertility. It might be due to genetic (Hill and Webb, 1982), feeding (Hughes and Varley, 1980), environment such as temperature, stress and season (Swiestra, 1970) chemical, and toxic agents, diseases and management. However, the causes of infertility and subfertility in this study was likely to be a complex factors due to environment, management and diseases. Since Thailand has temperature between 30-35°C during summer which is rather warm and incidence of infectious diseases is relatively high, therefore these two factors might play an important role for the cause of infertility and subfertility of the boars in this investigation. Concerning the management, with the method of alternate mating, the accumulation of defected

boars had increased in each farm due to the fact that farmers do not pay attention to fertility of the boar. Therefore, there are quite high percentage (6.7 to 13.9%) for infertile boars in the breeding herds. It is suggested that semen evaluation for individual boar is essential before using that alternate mating system. If it is not possible a single boar mating method should be used every 3-4 months in order to be able to check the fertility of each boar.

In conclusion, the economic lost in the pig breeding herds might be due to keeping the infertile or subfertile boars. The treatment and therapy of such boars is usually unsuccessful. Therefore, the strict periodic selective of good fertile boars is recommended.

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## บทย่อ

# อุบัติการณ์ของพ่อสุกรที่มีปัญหาการผสมพันธุ์ ในฟาร์มที่ใช้วิธีผสมโดยสลับพ่อ

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จุดประสงค์ของการศึกษาค้นคว้าครั้งนี้ ก็เพื่อหาอุบัติการณ์ของสุกรที่อยู่ในสภาพ เป็นหมัน และ/หรือให้อัตราการผสมติดต่ำในฟาร์มที่ใช้วิธีการผสมในลักษณะสลับพ่อ ศึกษาจากสามฟาร์ม ซึ่งใช้วิธีการผสมดังกล่าว โดยมีอัตราพ่อต่อแม่เท่ากับ 1:20 พ่อสุกรทั้งหมด 100 ตัว ได้รับการรีดเก็บน้ำเชื้ออสุจิ 137 ครั้ง ทำการตรวจสอบคุณภาพน้ำเชื้อควบคู่ไปกับการประเมินประสิทธิภาพการผสมพันธุ์ รีดเก็บน้ำเชื้อฯ สัปดาห์ละครั้ง ทำการตรวจซ้ำอีก 1-2 ครั้ง สำหรับพ่อพันธุ์ที่คุณภาพน้ำเชื้อฯ ผิดปกติ พบว่าพ่อสุกรมีปัญหาในลักษณะอัตราการผลิตน้ำเชื้อต่ำมีถึง 12% และเป็นหมัน 11.0% เพื่อยืนยันผลการศึกษา ส่งพ่อสุกรจำนวนหนึ่งไปชำเก็บลูกอ้วนเพื่อตรวจสอบรายละเอียดพ่อสุกรทั้ง 11 ตัวที่ผสมไม่ติดนั้น พบมีสาเหตุจาก fibrotic testes, total bilateral testicular degeneration และ epididymal dysfunction ในพ่อสุกร 4, 6 และ 1 ตัว ตามลำดับ

ผลที่ได้จากการศึกษาค้นคว้านี้ ชี้ให้เห็นว่าวิธีการผสมพันธุ์โดยการสลับพ่อในสุกรอาจ แฝงพ่อพันธุ์ที่มีปัญหา จึงแนะนำให้ตรวจน้ำเชื้ออสุจิพ่อสุกรก่อนการใช้วิธีการผสมโดยการสลับพ่อพันธุ์ หรือให้ใช้วิธีการผสมแบบใช้พ่อ-แม่เดียวผสมกัน ซึ่งสามารถประเมินประสิทธิภาพพ่อพันธุ์ได้

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\* ภาควิชาสัตวบาลศาสตร์ เชนูเวทวิทยาและวิทยาการสืบพันธุ์ คณะสัตวแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย