INFERTILE INVESTIGATION PROJECT OF CROSSBRED DAIRY CATTLE

2. RELATIONSHIP BETWEEN PERCENTAGE OF EXOTIC BLOOD AND CALVING RATE OF CROSSBRED DAIRY COWS IN RATCHABURI PROVINCE

โครงการศึกษาปัญหาและการแก้ไขการผสมติดยาก ในโคนมพันธุ์ผสม

2. ความสัมพันธ์ระหว่างเปอร์เซ็นต์ของสายเลือดพันธุ์ต่างประเทศ และอัตราการผสมติด ที่จังหวัดราชบุรี

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ภาควิชาภูมิศาสตร์–เธนุเวชวิทยาและวิทยาการสืบพันธุ์ คณะสัตวแพทยศาสตร์ จุฬาลงกรณ์มหาวิทยาลัย กท. 10500

บทคัดย่อ

การวิเคราะห์อัตราการคลอดลูกของโคนมพันธุ์ผสมสายเลือดต่าง ๆ กัน จำนวน 206 ตัว ในระหว่างปี 2521 ถึง 2524 ที่ราชบุรี พบว่า โคนมสายเลือด 50 เปอร์เซ็นต์มีอัตราการคลอดลูกดีที่สุดในทุกกลุ่ม ($P < 0.05$) รายละเอียดเกี่ยวกับการศึกษากลุ่มอายุของแต่ละสายเลือดพันธุ์ รวมทั้งศึกษาเปรียบเทียบจำนวนครั้งที่ผสมต่อการได้ลูกหนึ่งตัว ได้ศึกษาประกอบกันในรายงานนี้

Abstract

Calving rate of 206 crossbred dairy cows during 1978–1981 in Ratchaburi province was analysed. The findings indicated the 50% crossbred dairy cow outperformed othor groups in term of calving rate ($P<0.05$). Details of reproductive performance of each age group and percentage of exotic blood were also discussed.

Introduction

Upgrading of native cattle to be crossbred dairy cows at Nong–Po village, Ratchaburi province has be performed since 1960. At the beginning in 1964 to 1968 the population of cattle were native and F1 (50% exotic blood). Since 1969 the F2 generation (75% exotic blood) was increasing. The farmers who earned their living by cropping realized the benefit of dairy farming, so some of them domesticated the dairy cattle for the main job. Besides Livestock Development Department was also succeeded in promoting the farmers to increase the production of dairy cattle. Thus the area around Nong–Po was densed with the population of crossbred dairy cows. At the beginning several breeds for liquid semen production was used and there was no definite breeding programme. Crossbred dairy cattle population at Nong–Po and other districts which was under supervision of Ratchaburi A.I. Station were distributed equally. As the animal population increased, repeat breeding was also noticed which in turn caused low fertility.

In the literature, especially over the last two decades, contained a large number of reports showing that climate and other environmental conditions in tropical areas normally hindrance to the use of purebred dairy cattle and also cattle upgraded towards a temperate gene level. The purpose of this study was to investigate calving rate in each group of crossbred dairy cows. It was hypothesized that reproductive performance of lower exotic blood animal should be better than higher but at what level is a subject to be explored.

Materials and methods

Two hunderd and six crossbred dairy cows were randomized from breeding cards since 1971 to 1981. They were 50, 62, 5, 75, and more than 75% of exotic blood in the groups of 54, 15, 88 and 49 respectively. All cows were grouped according to the percentage of exotic blood and ages. The numerator of a fraction, as 1 year and 5 months old will be grouped of 1 year old. Vice versa, the 1 year and 6 months old will be grouped of 2 years old. The number of inseminations per calving as well as calving rate were recorded individually and were analysed as the data of this study.

Performance of different breeds and ability of fertilization of each semen lot as well as technique of inseminations were assumed to be equally distributed. Analysis of data were performed using Chi-square test, unpaired T-test and paired T-test (Snedecor and Cochran, 1980) for calving rate and the number of inseminations per calving in each exotic blood and aged groups.

Result

Overall for each group of animals, calving rate of 50% exotic blood group was significant higher than other groups ($P < 0.05$) as shown in figure 1. When aged

group was taken into account and compared among 4 exotic blood groups as shown in figure 2 (A–D), heifer cows (age 1–2 years) were not statistically different from others ($P > 0.05$), figure 2 A. At the age between 3 and 4 years (Fig. 2B), 50% exotic blood was significant higher than the group possesed more than 75% exotic blood ($P < 0.05$). At the age of 5–6 years (Fig. 2C), 50% and 62.5% exotic blood were significant difference ($P<0.05$) as well as 50% Vs 75%, 50% Vs more than 75% and 75% Vs more than 75%. At the group of 7 years and more than (Fig. 2D), 50 and 62.5% Vs 75% were significant differnce ($P < 0.05$).

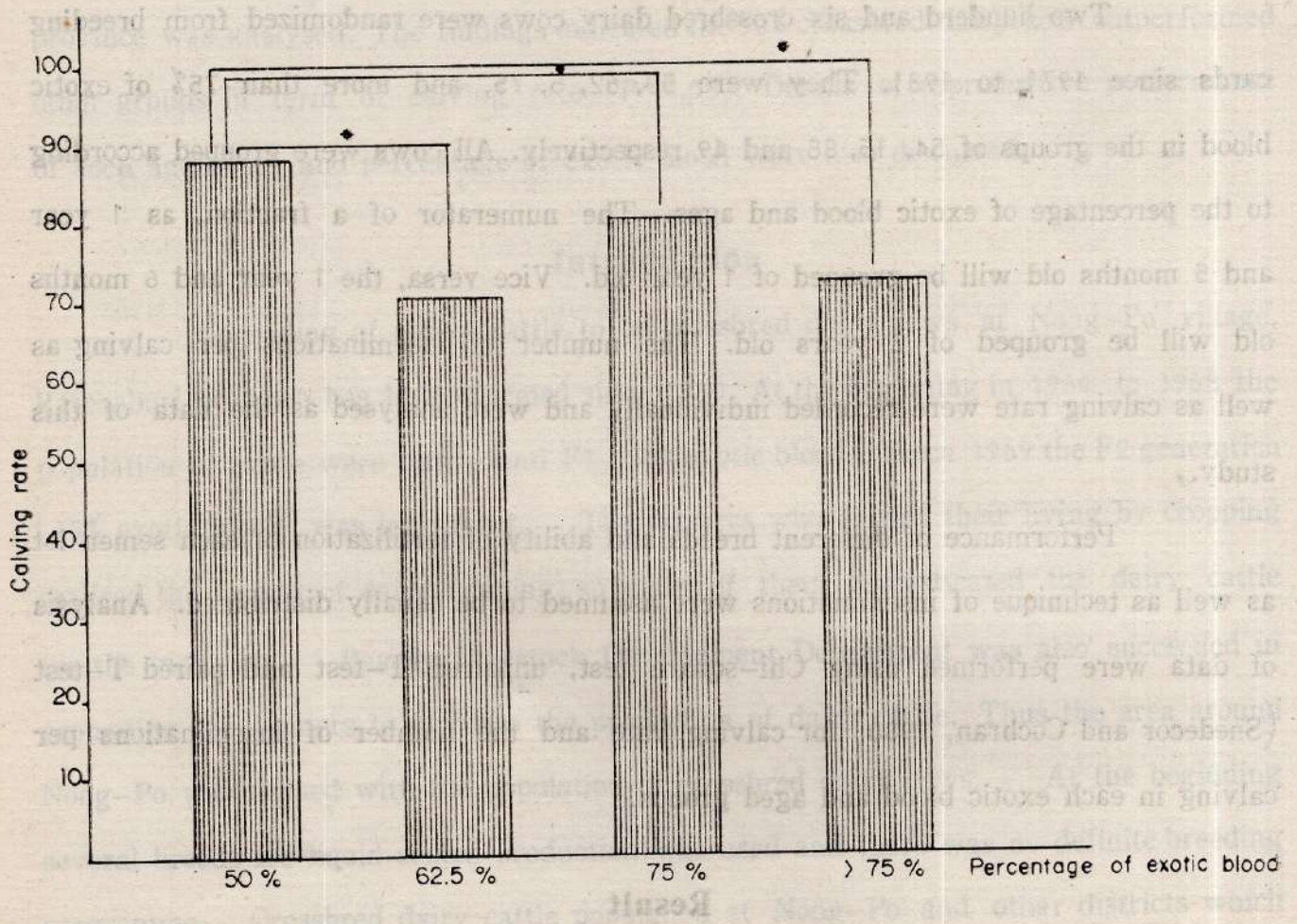


Figure 1 Calving rate of different crossbred dairy cow in Ratchaburi province.
* Significant difference between these groups at $P < 0.05$

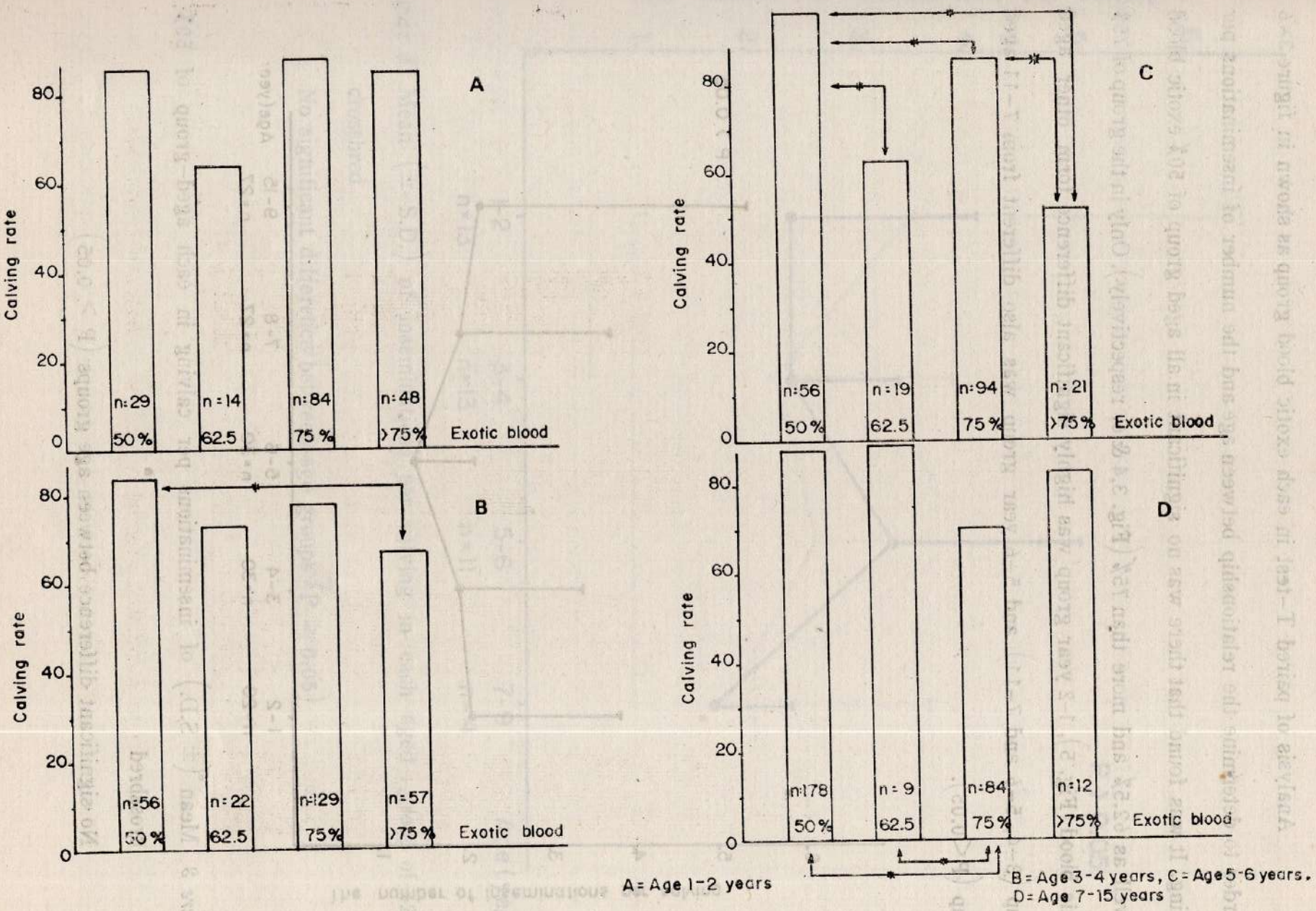


Figure 2 Calving rate in each aged groups of crossbred

*Significant difference between these groups at $P < 0.05$

Analysis of paired T-test in each exotic blood group as shown in figure 3-6 in order to determine the relationship between age and the number of inseminations per calving. It was found that there was no significant in all aged group of 50% exotic blood as well as 62.5% and more than 75% (Fig. 3,4 & 6, respectively). Only in the group of 75% exotic blood (Fig. 5), 1-2 year group was highly significant difference form other aged group (3-4, 5-6 and 7-11) and 5-6 year group was also different from 7-11 aged group ($P<0.05$).

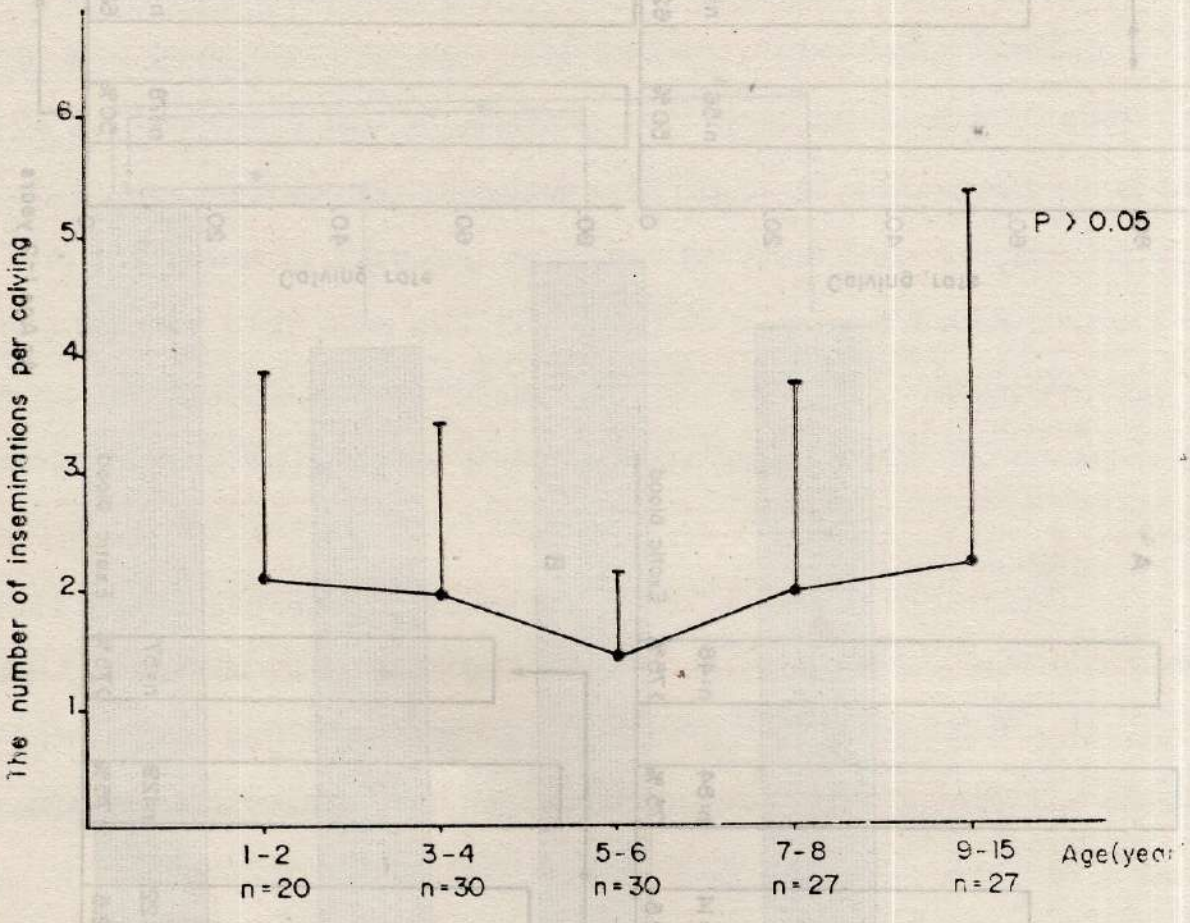


Figure 3 Mean (± S.D.) of inseminations per calving in each aged-group of 50% crossbred

No significant difference between age groups ($P > 0.05$)

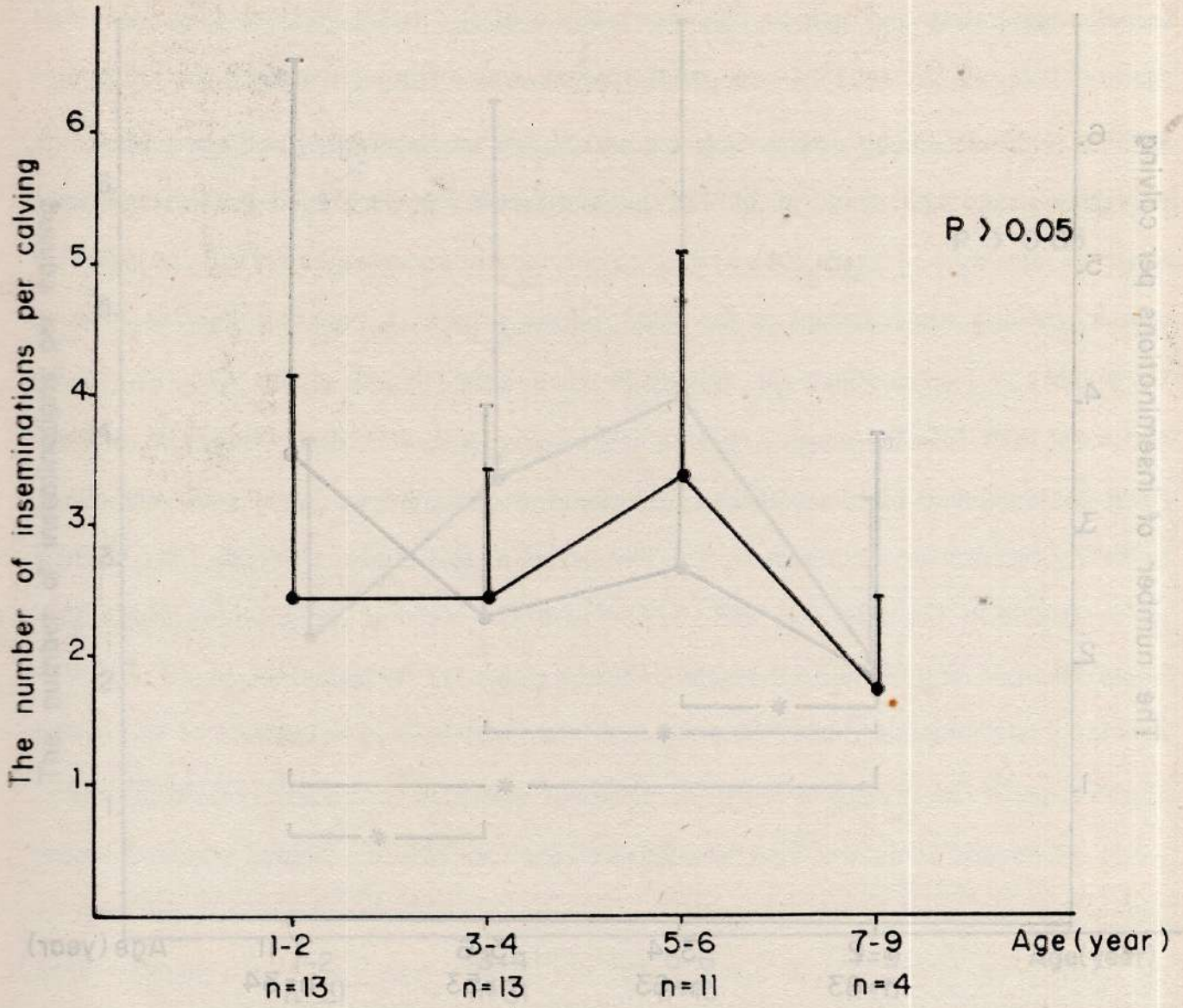


Figure 4 Mean $(\pm$ S.D.$)$ of inseminations per calving in each aged – group of 62.5% crossbred

No significant difference between age groups $(P > 0.05)$

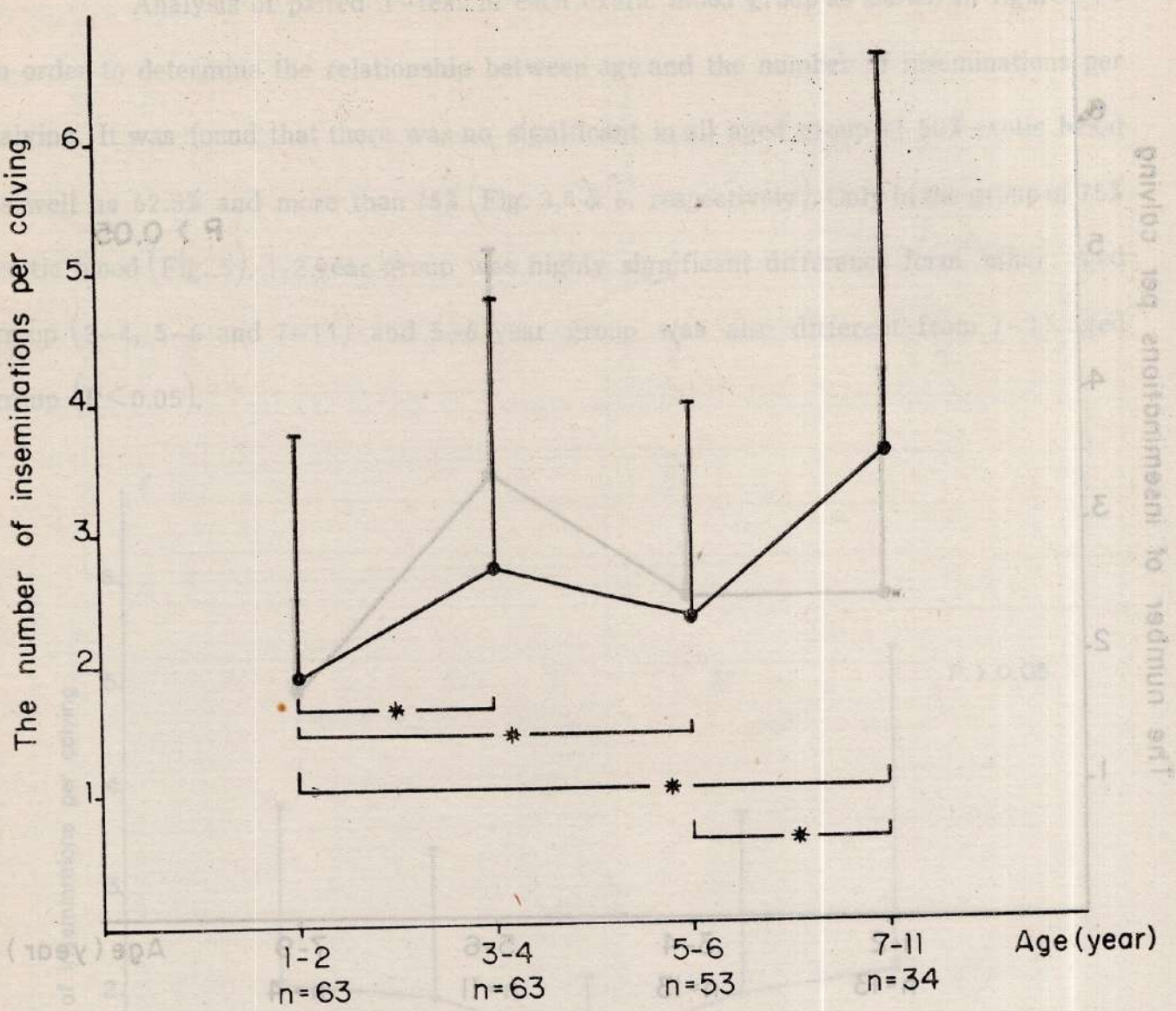


Figure 5 Mean $(\pm$ S.D.$)$ of inseminations per calving in each aged-group of 75% crossbred

*Significant difference between age groups $(P < 0.05)$

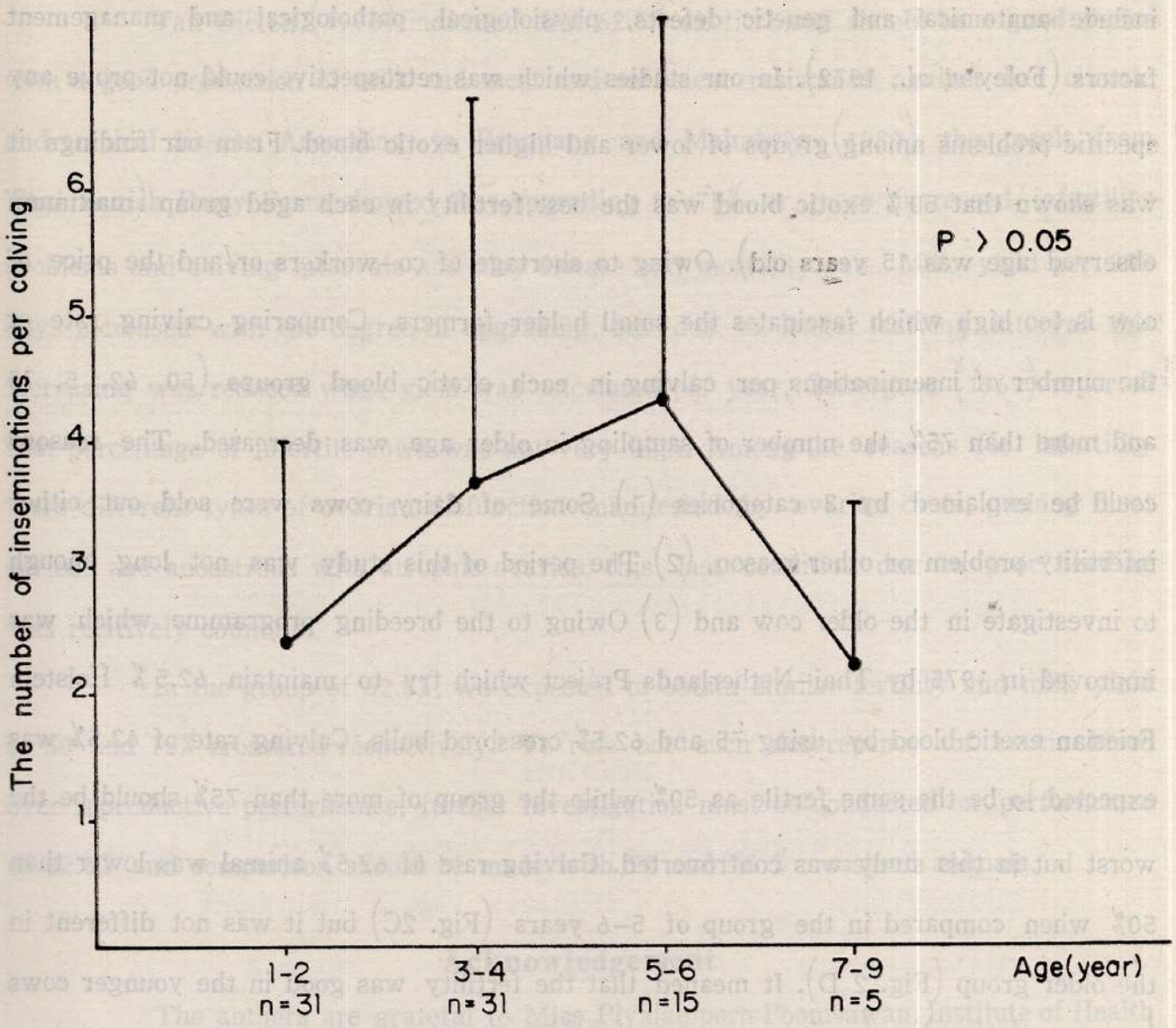


Figure 6 Mean $(\pm$ S.D.$)$ of insemination per calving in each aged-group of 75% crossbred

No significant difference between age groups $(P < 0.05)$

Discussion

Efficient reproduction in the cow can be attained by careful attention to a number of important details of herd management. The cause of reproductive inefficiency

include anatomical and genetic defects, physiological, pathological and management factors (Foley *et al.*, 1972). In our studies which was retrospective could not prove any specific problems among groups of lower and higher exotic blood. From our findings it was shown that 50 % exotic blood was the best fertility in each aged group (maximum observed age was 15 years old). Owing to shortage of co-workers or/and the price of cow is too high which fascinates the small holder farmers. Comparing calving rate or the number of inseminations per calving in each exotic blood groups (50, 62. 5, 75 and more than 75%, the number of sampling in older age was decreased. The reasons could be explained by 3 categories (1) Some of dairy cows were sold out either infertility problem or other reason, (2) The period of this study was not long enough to investigate in the older cow and (3) Owing to the breeding programme which was improved in 1975 by Thai-Netherlands Project which try to maintain 62.5 % Holstein Friesian exotic blood by using 75 and 62.5% crossbred bulls. Calving rate of 62.5% was expected to be the same fertile as 50% while the group of more than 75% should be the worst but in this study was controverted. Calving rate of 62.5% animal was lower than 50% when compared in the group of 5-6 years (Fig. 2C) but it was not different in the older group (Fig. 2 D). It meaned that the fertility was good in the younger cows (not older than 5) in each group. When the infertility was observed, the farmer solved the problem by selling them so the number of sampling in the older was lower than the younger. Nevertheless, fertility in the younger group of 50% was not different from the older one. Thai farmers always keep their cows until repeat breeding is noticed or they can not raise more than 6 cows. According to Foley (1972), fertility in dairy cows increases up to 4 years of age, remains constant to 6 years, then gradually decreases with advancing age. But in the U.S.A., age is not a major cause of infertility in dairy cattle because most are culled before they get old.

Van Dieten (1978) indicated that 62.5% exotic blood should be a good choice with a good production of milk and meat and sufficient resistance against bad climate and tropical disease. According to Brannang and Malmberg (1980), the result from Thai Danish Dairy Farm showed that upgrading to 75% or more increased infertility problems and calving intervals and also disease and mortality rate. Milk yield per 305 days increased with the degree of upgrading, but due to longer calving interval this increasing was reduced when yield was calculated per year. Settergren (1969) reported that percentage of infertile cows was not very high. Among the reasons for infertility were different types of ovarian disfunction manifested by ovarian cysts, prolong heat periods and anoestrous with atrophic ovaries; this last condition due to poor feeding was relatively common.

In the group of 62.5%, we expected to obtain similar fertility and milk yield to 50 and 75% crossbred respectively. To rule out such descrepancy of exotic blood over reproductive performance, further investigation must be conducted on performance of 62.5% and comparison should be made with 50 and 75 % crossbred animals.

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รักของแม่

เปรี้ยบร่มเงา ใต้ไทร ต้นไม้ใหญ่
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