



UNIVERSITI PUTRA MALAYSIA

**A SURVEY OF THE CATTLE ARTIFICIAL INSEMINATION (A.I.)
SERVICE AT SEREMBAN DISTRICT, NEGERI SEMBILAN.**

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**A Survey of the Cattle Artificial Insemination (A.I.)
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**Animal industry project paper presented as partial
fulfillment of the Doctor of Veterinary Medicine course
at Universiti Pertanian Malaysia, February 1980.**

ACKNOWLEDGEMENT

I wish to acknowledge that full cooperation and assistance were given by the Director of the Negri Sembilan Veterinary Service, personnel of the Seremban Artificial Insemination Centre, Seremban Milk Collecting Centre and Seremban District Veterinary Office at Rahang. I am indebted to my supervisor, Dr. M.R. Jainnudeen for not only for his guidance in the survey but for being my teacher who has instilled in me the interest in animal reproduction.

ABSTRACT

Since the Seremban Artificial Insemination Centre was transferred from Paroi to the Seremban District Veterinary Office at Rahang in 1974, the number of inseminations per year, number of cattle owners using A.I. and number of dairy cattle inseminated each year had declined. Various reasons were given for the decline. The problems faced by the A.I. centre and the cattle owners were also given. A.I. had not made any impact among the beef cattle owners and less than 2% of the adult beef cattle were inseminated each year (1974 to 1979). The majority of the cattle owners surveyed were not satisfied with the A.I. service.

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INTRODUCTION

The artificial insemination (A.I) service in Negri Sembilan started in 1963 at Paroi, Seremban. In 1974 the A.I. centre was relocated to the Seremban District Veterinary Office at Rahang, Seremban due to the state housing development project in Paroi.

The purpose of the A.I. service was to upgrade the indigenous cattle through a crossbreeding programme utilizing imported progeny tested frozen semen of exotic breeds. The performance of the first generation of crossbreds was favourable. They are generally well-adapted to local conditions with improved milk yield, age at first calving and calving interval (Rajagopal, 1975). The use of A.I. for crossbreeding Kedah-Kelantan cattle resulted in improved performance in the crossbreds in terms of birth weight and growth rate (Flint, 1971).

However the introduction of A.I. which is a sophisticated technique of advanced animal husbandry into Malaysia has met with many problems. The objective of this survey was to study the problems which arise from the introduction of the A.I. service, the acceptance of the cattle owners to A.I. in the Seremban district and the progress made by the Seremban Artificial Insemination Centre at Rahang, Seremban.

LITERATURE REVIEW

Artificial insemination(A.I.) is introduced into a country because of two main advantages: prevention or eradication of diseases and genetic improvement of the livestock. In Japan and Israel, brucellosis, vibriosis and trichomoniasis had been eradicated with the use of A.I. Most of the tropical countries, the use of A.I. is primarily to improve the local breeds of domestic animals to meet increasing demand for food(Whetstone, 1972).

The selective breeding would take over 150 years to improve the tropical cattle to the same level as temperate cattle (MacLusly, 1967). The use of crossbreeding has been accepted as the most practical approach to cattle or any livestock development in many environment(McDowell, 1972). At the Central Animal Husbandary Station, Kluang, the milk yield of the crossbreeds were found to be more than 100% greater than the Local Indian Dairy(LID) cattle and they adapted satisfactorily to local conditions(Rajagopal, 1975). The Kedah-Kelantan(KK) cattle may also be improved through crossbreeding with exotic breeds(Flint 1971). These results illustrated the potential use of A.I. in which the crossbreeding programme can be carried out in an extensive scale at much less cost.

A.I. has not made any great impact in the tropics. Probably the greatest benefit is the regular contact between technicians and farmers which can be used as a spear head in animal production extension work(Rollinson, 1971). In Malaysia, the slow

response to A.I. is attributed to a lack of interest among farmers as they are preoccupied with their main occupation; a non-hazard nature of cattle farming where cattle roam freely in search of grass; poor communication ~~system~~ between farmers and the A.I. centre and inability of farmers to detect proper ~~heat~~ estrus (Veterinary division, 1976).

Crossbreeding of cattle utilizing A.I. will no doubt improve the genetic potential of the local cattle. The successful development of livestock improvement programmes need an integrated approach in the improvement of nutrition, management and health of the cattle and marketing of the product. (Mishra devan, 1977).

MATERIALS AND METHODS

This survey was conducted in Seremban district from 10th. December, 1979 to 20th. January, 1980. The Seremban A.I. centre serves an area of 367.3 sq. miles. The distance between the centre and the farms ranged from less than one quarter mile to 20 miles. In 1978, the estimated number of cattle owners and cattle population were 1000 and 9,496 respectively. The largest concentration of cattle were in the rubber estates (20.7%).

During the survey, the Seremban A.I. centre was in the herd health section of the Seremban District Veterinary Office. It was supervised by a veterinary officer with three inseminators, two inseminators for cattle and one for pig. The cattle inseminators were a veterinary assistant and a veterinary attendant. The main communication system between the centre and the cattle owners was by telephone. Occasionally the cattle owner would come personally at the centre. The recording system consisted of the daily insemination record. There was no individual farm record.

Collection of data and information about the A.I. services in Seremban district were obtained from :

- (a) Analysis of records kept at the Seremban A.I. centre, personal interviews and observation of the personnel of the centre.
- (b) Interviews with cattle owners in the mukim of Seremban, Lenggeng, Setul, Labu, Pantai, Rasah, Rantau and Ampangan. Cattle owners were selected on the basis of the A.I.

record, Milk Collecting Centre record and also during visits to the various mukim.

A questionnaire was prepared for interviewing the cattle owners (Table 1.). The questionnaire were in two parts. Part A was on the various aspect of cattle management and part B on the reproductive management especially those related to the A.I. service.

TABLE 1. SUMMARY OF QUESTIONNAIRE

Part A	Part B
Owners' particulars such as age, education, farming experience and occupation,	Reproductive management.
Cattle management,	Method of breeding used.
Housing,	Management of bull.
Nutrition,	Preference breeding method.
Herd health programme,	Reasons for choosing A.I. and or natural service.
Recording system,	Opinion on the A.I. service.
Opinion on the health service.	Opinion on the crossbreds.
	Problems faced by owners regarding A.I. service.
	Reproductive problems.
	No. of A.I. used in 1979.
	No. of calves born from A.I. in 1979.

RESULTS

Artificial insemination service

The A.I. service was provided free to the cattle owners starting at 8a.m. and ending at 4.15p.m.. There was no service on Sundays or holidays. The inseminators either used motorcycles, or a stationwagon for carrying out the daily. Apart from the insemination service, the inseminator had to ear tag the cattle.

Handling and thawing of semen straws. The frozen semen used were imported and stored in liquid nitrogen tanks. There was lack of care in handling the frozen straws. The liquid nitrogen level in the tank was checked only occasionally. Prior to the insemination, the frozen straw was transferred directly into the inseminating gun without proper thawing. The seal of the straw was sliced off with a scalpel blade rather than cut with a pair of scissors. This resulted in the spillage of the semen into the plastic sheath during insemination.

Quality testing of semen. Due to limited facilities, the semen quality was not checked regularly.

Insemination technique. The insemination was carried out by the rectovaginal method. Sometimes, it was difficult to inseminate the cows as there were no proper restraining facilities in the farm.

Performance of the Seremban A.I. centre

Number of inseminations. The number of insemination in Seremban district had increased to about seven fold(from 121 to 833) from 1963 to 1973(Fig. 1). However, the number of inseminations had decreased from 833 in 1973 to 509 in 1979 when the centre was relocated from Peroi to Rahang, Seremban.

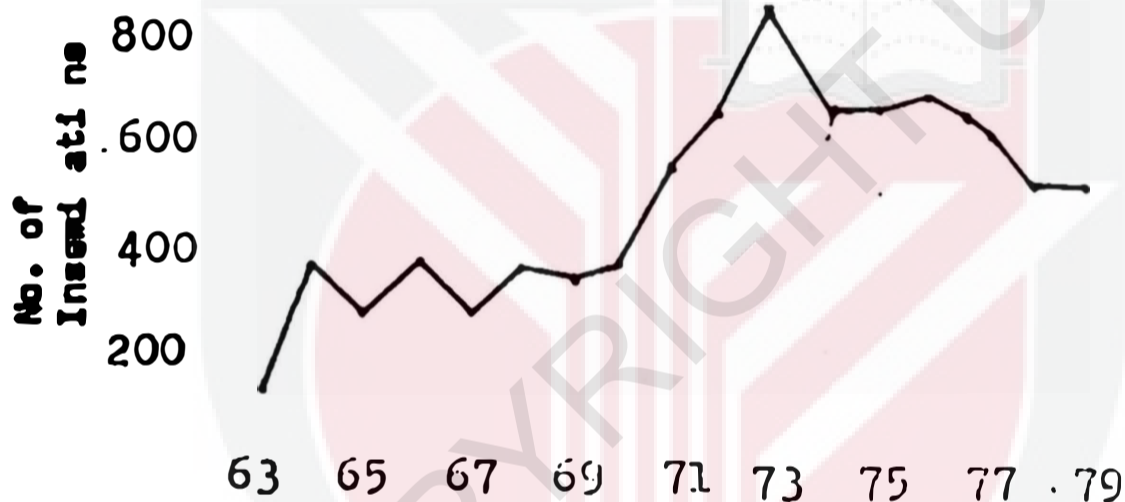


Figure 1. Number of insemination per year (1963 to 1979).

Insemination per inseminator per day. The average number of insemination per inseminator per day was less than one. From 1974 to 1979, the highest was 0.9 and the lowest was 0.7

Table 2 Average number of insemination per inseminator per day

Year	1974	1975	1976	1977	1978	1979
Av. no. of insemination per inseminator/day.	0.9		0.9			0.7

Cattle artificially inseminated. About 90% of the cattle inseminated were of dairy type(Fig. 2). Since 1974, less than 2% of the total adult female beef population were inseminated. Although there were an increase in the adult female population, the percentage of dairy cattle inseminated had ^{shown} a mark decrease from 46.4% in 1975 to 19.9% in 1978.

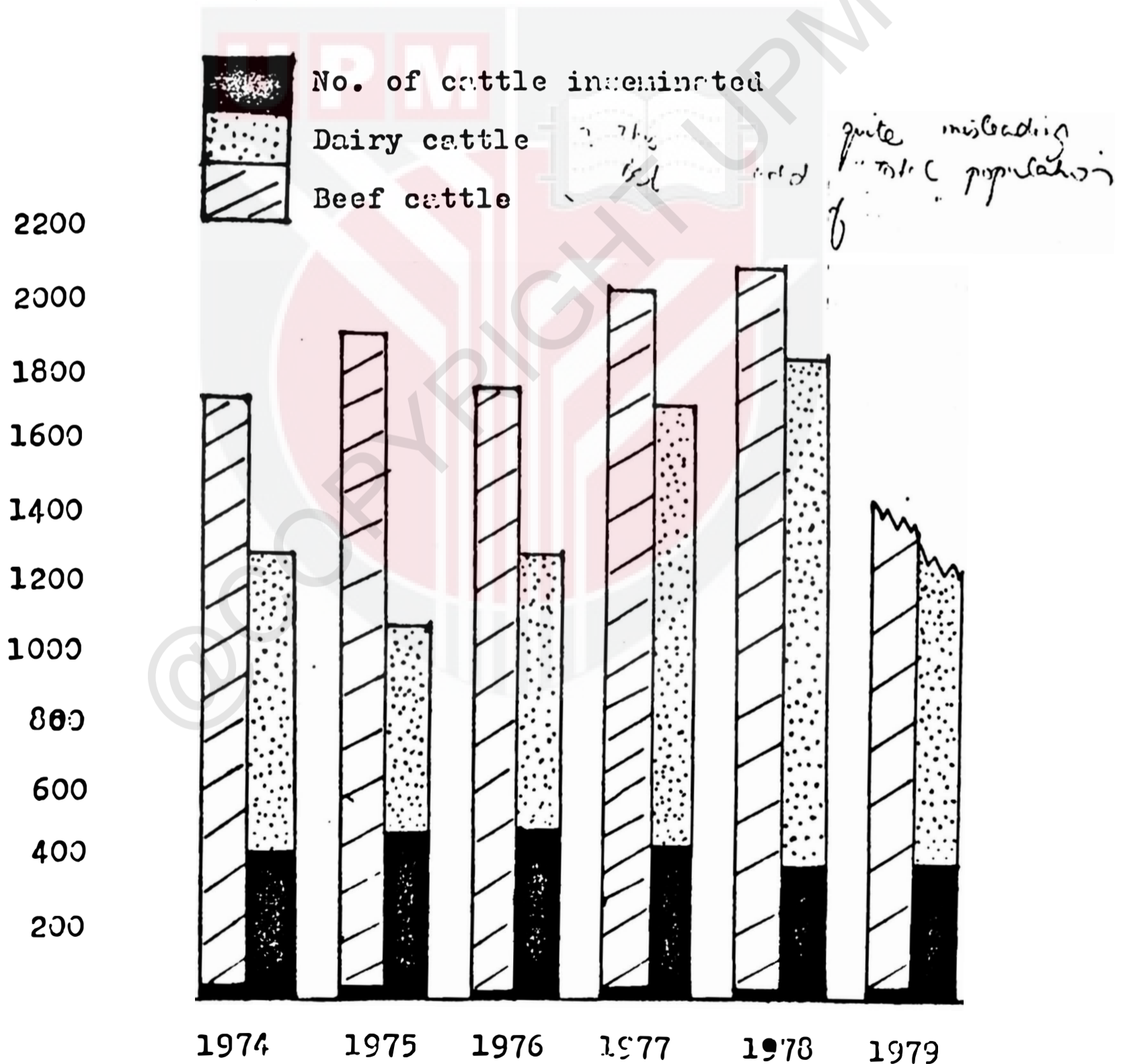


Figure 2. Number of cattle inseminated per year (1974 to 1979)

Cattle owners using A.I. services. The number of cattle owners using the A.I. service fluctuated from year to year (Table 3). Out of an estimated 1,000 cattle owners, only about 20% to 25% of them were using the A.I. service.

Table 3. Number of cattle owners using A.I. services

Year	1974	1975	1976	1977	1978	1979
No. of owners	255	262	265	251	207	227

Conception rate. Due to lack of reliable records the conception rate were computed during the survey on the number of cattle not being presented for a second service (Table 4). The non-return rate to first service had shown improvement since 1974.

Table 4. Conception rate at Seremban A.I. centre based on non-return rate to first service#

Year	No. of inseminations		Percent non-return
	First	Second	
1974	434	127	70.7
1975	510	124	75.7
1976	497	132	73.4
1977	462	104	77.5
1978	378	82	78.3
1979	421	63	85.0

Non-return rate based on cattle not being presented for second service.

Problems faced by the Seremban A.I. centre.

The various problems encountered by the centre were:

- (a) Lack of proper administration of the A.I. service due to the frequent changes in the supervision of the centre. Since 1974 the supervision had changed four times.
- (b) The area served by the centre was too large and the farms were scattered in a wide area.
- (c) Failure of cattle owners to detect proper heat and call the service in time.
- (d) Difficulty faced by the inseminators in carrying out their duty such as lack of proper restraining devices. Some cattle farms do not have proper address and the roads were rough or inaccessible to motorised vehicles.

Results of questionnaire

A total of 63 cattle owners (average age of 45 years) were interviewed in the Seremban district (Table 5).

Table 5. Distribution of cattle owners and cattle population surveyed.

	Mukim							
	Sen	Set	Lenggong	Labu	Antai	Rasah	Rantau	Ampang
No. of owners	12	8	14	8	7	4	4	6
No. of cattle	87	79	165	85	61	39	61	66
Av. no. of cattle per owner	7	10	12	10	9	10	15	11

Of the 63 cattle owners, only six were full-time cattle farmers. The majority of the cattle owners interviewed were dairy cattle owners(68.2%) while the rest were owners of beef cattle(4.8%) or both(27.0%). Seven farmers received training at the Animal Husbandary Station, Pantai, which was a prerequisite for the owners to be eligible for the Milk Collecting Centre scheme.

The survey revealed that the management practices were essentially similar to those describe for beef and dairy cattle farming in Malaysia. The MCC farms had better management system.

Reproductive management.

Method of cattle breeding. Twenty one out of 43 (48.8%) of the dairy cattle owners used only A.I. for breeding(Table 6). Twenty six(41.3%) of those surveyed did not use A.I.. Those farmers practising both methods of breeding utilised A.I. for dairy cattle and not beef cattle because of the fear that A.I. would cause dystocia in the Kedah-Kelantan cattle.

Table 6. Reproductive management in the farms surveyed

Types of farming	No. of farms surveyed	Breeding methods		
		A.I.	Natural service	Combination
Dairy	43	21	12	10
Beef	3	1	2	-
Mix	17	2	12	4

Reasons for using A.I. The majority of the owners used A.I. because there was lack of bulls in the area for natural service and/or to obtain superior crossbreds through A.I. (Table 7). Nine(23.7%) of them used A.I. because they had problems in maintaining bulls.

Table 7. Reasons for using A.I.

Reasons	No. of owners
Lack of bull for natural service	31
To improve productivity	38
Problems of maintaining bulls	9

Reasons for not using A.I. The dairy cattle owners who did not use A.I. stated that because it was difficult to obtain the service. Some of them had tried A.I. service but due to inconsistent service and poor conception rates they reverted to natural service.

Opinion on the crossbreds. All the cattle owners, except one, agreed that the crossbred had higher milk yields and body weights.

Opinion on the A.I. service. Only 54 of the 63 owners surveyed expressed their opinion. Of the 54 owners 13(24.0%) were satisfied with the service. The majority of the owners(76.0%) had a very poor opinion of the service. This was due to the inconsistent service and poor conception rates they had experienced.

Problems faced by cattle owners regarding A.I.

Of the 63 respondents 13 indicated they had no problem regarding the A.I. service. Among the problems experienced by the majority were: (a) Difficulties in communication with the A.I. centre due to the distance and lack of telephone facility; (b) inconsistent service by the A.I. centre; and (c) poor conception rates.

DISCUSSION

The use of A.I. which is an expensive and sophisticated technique requires well-trained and dedicated staff with proper organisation and recording system. The Seremban A.I. service being the first in Malaysia has shown a decline in performance since its relocation from Paroi to Rahang, Seremban in 1974. Several factors may have contributed to the poor performance: Even after 16 years of experience, a proper organisation and administration of the service was lacking. The frequent changes in the supervision (four times since 1974) resulted in a poorly organised service. It was virtually run by the inseminators as they please. In addition, the A.I. service was stopped temporarily in the middle of November 1978 to early January 1979 because of the foot and mouth disease outbreak in Malaysia. During this period, the inseminators were assisting in the FMD control programme. Another possible reason was that some cattle owners in the Seremban town council who were frequent users of A.I. had to reduce their herd size or give up cattle farming due to more land being used for other development projects.

The handling and thawing of frozen semen in the centre needs improvement to ensure a better conception rate. In general the faster a specimen is frozen (such as the semen straw) the more rapidly it should be thawed for optimal survival (Salisbury et al., 1978). A satisfactory thawing method is to thaw in warm water at 35°C for 30 seconds or at 75°C for 12 seconds (Robbins et al., 1972).

The non-return (NR) rate which was estimated from the number of cattle not presented for repeated service was erroneous. The inaccuracy could arise due to: (a) no proper recording and identification of animals, (b) accidental natural mating before or just after the insemination, (c) a cattle owner may use another A.I. centre for repeated service, (d) the cow may die or be sold and (e) poor heat detection. All these errors will be recorded as NR rate to first service. The average conception rate to first service for farmers around Kluang Animal Husbandary Station was higher (60.8%) than those obtained within the Animal Husbandary Station, Kluang (42.7%) (Annual Report A.H.S., Kluang, 1977). At present the true conception rate cannot be determined because of the lack of proper records.

Cattle owners surveyed accepted A.I. as a way to improve their cattle. The popularity of A.I. was closely associated with the owners desire to obtain crossbred animals. A.I. was considered as the fastest and more economical means of obtaining crossbreeds which were costly and scarce. However, the owners difficulties in getting an A.I. service. The main reasons

because of the long distance. Also the time the A.I. service was available conflicted with the working hours of the cattle owners. The other problems were the inconsistent service and poor conception rates. Social or religious prejudices did not influence the acceptance of the A.I. service.

During the survey, a large population of crossbreds among the dairy cattle owners were noted. With more farmers taking dairy farming under the Milk Collecting Centre Scheme (MCC) at Lenggeng and Mantin, the number of crossbreds will increase. Success of these farmers will depend on the efficiency of the A.I. service as there are lack of crossbred bulls available. Among the 63 farms surveyed only 3 farms had crossbred bulls.

From the result of this survey, it is evident that several improvement to the Seremban A.I. service need to be made. There is a need for a proper organisation and recording system of the A.I. service maintained by a core of well trained and dedicated staff. Individual farm record could be introduced.

The working hours of the A.I. service should suit the convenience of cattle owners. The insemination services should be available twice a day from 6 a.m. to 9 p.m. and from 3 p.m. to 7 p.m.

Instead of waiting for the farmers to call for the service the inseminator could visit the farmers on a fixed route. The cattle owners can bring their cattle to a designated place or wait for the inseminator by the roadside. As the area covered is too large, another A.I. centre can be based at Mantin to

serve the northern areas. The centre should provide an extension service to educate farmers on heat detection and improved cattle husbandary.

Compulsory castration of all bulls should only be done if the A.I. service is considered to be adequate.

The A.I. service also needs a good reproductive health service.

The use of motorcycle to carry the storage tank was not convenient. In the tropics, room temperature semen extenders have been tested to overcome the problems of transportation and storage of semen. Coconut water plus egg yolk was tested and conception rates of 39-61% were obtained with 3 to 5-day-old semen stored in the dark at room temperature (Rollinson, 1971). New Zealand workers used Caprogen, an ambient temperature extender at 18-24°C without severe loss of fertility of the spermatozoa (Salisbury et al., 1978). The disadvantage is that the frozen semen needs to be resuspended in Caprogen before use, which is inconvenient. Since the semen can only be stored for a few days, its use is not possible at present because of the few inseminations done per day.

Synchronization of oestrus with its advantage of insemination at a predetermined time can be utilised in areas where cattle in large numbers are concentrated e.g. rubber estates. Synthetic progestagen and prostaglandin F_{2α} are commonly used (Manns, 1975). The fertility of treated and untreated cows and heifers were found not to be significantly different (Hafs, 1975).

REFERENCES

- Annual Report (1977). Central An. Husb. Station, Kuala Lumpur.
- Flint B. (1971). Crossbreeding Kedah-Kelantan and Local Indian Dairy cows with American Hereford, Brahman and Jersey bulls by A.I. College of Agric., Malaysia. Research publication no.2, Animal Science Series no. 1.
- Hafs H.D. and Manns J.G. (1975). Onset of oestrus and fertility of dairy heifers and suckled beef cows treated with Prostaglandin F2. *Animal Production* 21:13-20.
- MacLusly D.S. (1967). Some aspects of animal production in West Malaysia. *The Malaysian Vet. J.* vol.4 no.2 pp 55.
- Mahadevan P. (1977). Lesson for development from successful experience with dairy cattle crossbreeding. *Mal. Appl. Biol.* 6,2:235-242.
- Manns J.G. and Hafs H.D. (1975). Controlled breeding in cattle: A review. *Canadian J. of An. Sc.* 56:121-130.
- McDowell R.E. (1972). *Improvement of Livestock Production in Warm Climates.* W.H. Freeman and Co., Publishers.
- Rajagopal K.M. (1975). Crossbreeding for milk production. *Proceeding of the Symposium on Bridging the Dairy Gap.* Min. of Agric. and Rural Development.
- Robbins R.K., Gerber L.E. and Sacke R.G. (1972). Influence of thaw rate on maintenance of the acrosomal cap. *J. of An. Sc.* 35:253.
- Rollinson D.H.L. (1971). Further development of artificial insemination in tropical areas. *An. Breed. Abs.* vol.39 no.3 pp. 407
- Salisbury G.W., Van Demark N.L. and Lodge J.R. (1978). *Physiology of Reproduction and Artificial Insemination of Cattle.* 2nd. edition. W.H. Freeman and Co., Publishers.
- Veterinary division (1976). The development of cattle A.I. service in Peninsular Malaysia. *Vet div Min of Agric Malay*

Whetstone L. and Smith H. (1972). A Market for Animal Semen ?
The Institute of Economic Affairs. Research monograph no. 29.

