

HERD LIMITS TO GENETIC IMPROVEMENT OF DAIRY COWS

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The motto of the old herd test association of Victoria was "WEED, BREED and FEED". My father's version was "WEED and FEED, BREED and FEED, and FEED and FEED". His herd of 40 to 45 cows produced 350 to 500 lb. of butterfat. They were fed root crops (turnips, mangles), oaten chaff, bran, etc., as well as pasture; the cost of these inputs being relatively cheap in terms of labour etc.

The modern herd of 100 - 150 + cows milked by one man and perhaps his wife, and relying on pasture and hay, would probably be looking at 300+ lb. of butterfat. I think we would all agree that the quality and economic value of the fodder input has a marked effect on production. The capacity of the "national herd" could be considerably increased in this area.

As production is our aim, and if the herd is fed the maximum economical amount of fodder, we must look to breeding to develop a cow that effectively converts this fodder to good quality milk suitable for our requirements.

In the "modern" herd there are many factors that can influence and limit this breeding process. These are:-

- (a) Management
- (b) Nutrition
- (c) Herd Health
- (d) Quality of bulls used

(a) Management and Capacity to Rear Replacements

With herd size increasing and labour decreasing, it is natural for the operator to manage his herd so as to maximise production, reduce his own labour and increase his leisure time. The popular method of achieving this is to concentrate calving into a short period, milk cows through the flush period of the year and supplement them through the summer months with available green crops, silage or hay. They are dried off at 8-10 months according to their condition and production. The cows are then fed to ensure reasonable to good condition at calving.

The joining period generally begins with cows detected in heat over a six week period being mated to A.B. bulls irrespective of production, and the remainder being joined to herd bulls of inferior quality or beef bulls. This often means that the better dams are not joined to A.B. bulls. As an example, actual figures from our herd are:-

	<u>1978-79</u>	<u>1979-80</u>	<u>1980-81</u>
Cows joined to A.B.	115	118	120
A.B. calves conceived	84	87	54
Calves successfully reared	24	30	41

Obviously from these figures, it can be deduced that in a large commercial herd, too much reliance cannot be placed on the dam. In addition to this, the farmer's ability to rear, and the capacity to hold cows in peak condition until calving can also have a marked effect on production.

Heifers born early in the calving period are also more likely to be kept than those born later because it is easier to rear calves in a group that is of similar age. This means that replacements will come from good cows calving early, rather than better cows calving later.

The ability to select which replacements will be superior in the milking herd is usually impossible until after they have calved. Some interesting research has been done in the Allansford (Vic.) area in relation to the use of glucose blood levels as indications of production (Rowlands, 1981).

Blood samples taken from heifer calves 3-5 months old in 1973 and evaluated by Dr. D. Fenwick in 1979, indicated a correlation between high blood sugar levels and subsequent high production. R. Deppler, Veterinary Surgeon of Allansford, is currently continuing research in this field.

(b) Nutrition

In our climatic conditions, the management program recommended and increasingly being used, is designed to maintain the herd in high production and adequate condition throughout the whole year. During the period April to late June the herd is dried off and either agisted or confined in a small area and fed grass hay. This practice allows farm pastures to grow and be available as a continuous and plentiful supply of fodder for the newly calved herd.

It is important that the newly calved cows reach their peak during the first six weeks of lactation as this sets the standard for the whole lactation.

Throughout the Summer and early Autumn months, the herd is supplemented with silage and green crops.

If seasonal conditions are unfavourable and agistment and supplements in short supply, calving and cleaning troubles as well as poor conception rates can occur.

During the last two seasons local veterinary surgeons suggested that these effects have had a major effect in causing high cow "not in calf" rates.

Adequate nutrition both prior to calving and after calving to joining will have a major effect on the ability of cows to calve in a concentrated pattern. This concentrated pattern enables the best selection of calves which can be reared together and weaned on to adequate green pasture.

(c) Herd Health

The causes of infertility are many and varied. They include venereal diseases such as vibriosis and brucellosis, and others such as leptospirosis.

Further wastage can also occur through metabolic diseases such as grass tetany and milk fever. The relationship between these diseases and the use of modern fertilisers is perhaps an area for more research.

Of all diseases affecting dairy herd production, mastitis can be the most devastating, resulting not only in the loss of cows, but often the loss of the top producers in the herd. Preventative measures such as the Five Point Plan, (running water, machine checks, dry cow therapy, culling, test dipping) and the proper design of milking sheds and yards, can help in reducing the incidence of this disease.

The proper use of antibiotics is essential if they are to be retained as useful tools in the fight against mastitis. I have found that indiscriminate use of antibiotics in calves can result in reduced immunity to other diseases.

(d) Quality of Bulls Used

With natural wastage reducing our ability to rear replacements from superior dams, a large part of genetic gain in commercial herds must be obtained by the use of genetically superior bulls. These bulls must have the capacity to breed superior cows.

As a large number of bulls are required to service a commercial herd in a short time, the expense of buying suitable bulls and the cost of their upkeep is considerable. It is practical therefore, to use an Artificial Breeding Program. We rely on such a program to produce high production, functional conformation and above average workability traits (ease of milking, temperament, etc.) in the offspring.

It is interesting to note the selection pressures for choosing bulls applied by the Victorian Artificial Breeders' Co-operative since the inception of progeny testing.

No. of bulls put to test	719
No. of bulls proof available	563
No. of bulls used after proof	109
Percentage held after proof	19.4%

(V.A.B. statistics (1982)).

R.W. Everett (1981) has noted that the mating of elite cows to produce young sires is a practice exclusively confined to stud herds, except in Tasmania, and to a lesser degree in Victoria. He indicates that 9% of the national herd are registered, and that only 28% of these registered herds are milk recorded. This limits elite cow selections to 2.5% of the population.

Everett (1981) also indicates that dairymen frequently use natural service or "Glamour Sires" from Artificial Insemination, and notes that few stud breeders participate in organised Artificial Breeding young sire programs. This limits genetic progress to the genetic progress of stud herds. Two solutions he suggests are:-

- (1) The convincing of stud masters that it is in their interests to support organised Artificial Breeding sire programs.
- (2) Allowing all milk recorded cows to be potential bull mothers, and implementing a B.L.U.P. cow evaluation system to rank cows between herds with greater accuracy.

Whilst I agree with these solutions, I feel that the gains in the short term will be slow for the following reasons:-

A. The Tendency of Farmers to Opt out of Herd Recording

While farmers appreciate the advantages of herd recording, times of economic stress and labour shortages force them into a system of priorities. In these instances herd recording is usually the first practice to be discontinued.

In the near future, I believe that H.I.O.V. will be able to supply all Victorian farmers with enough management information, production records, stock registers, and herd health breeding and feeding programs, etc. to convince them and their bank managers that herd recording is a viable and profitable proposition.

B. Breed Purity

Each breed of cattle designates an animal of a particular type. The Friesian cow for example, is a large framed animal, capable of supporting a large vessel and producing a substantial quality of milk. Unless we maintain strong breed purity, the introduction of larger strains of Friesian Holstein cattle from Canada, U.S.A. and Britain may cause us to experience calving problems.

The aesthetic value of a true to type good line of cattle can instil in a dairyman a sense of pride and encourage him to maintain and to improve his herd.

C. Lack of Records

Lack of records alone places a big restriction on the number of cows used as non-registered mothers. It is necessary for a potential bull mother to have an authentic record of family and production before she can be accepted into a bull program.

If commercial farmers wish to benefit from the genetic gains available in this area, they must co-operate by herd recording on a permanent basis and ensuring that proper records are kept.

Other areas that limit our ability to obtain maximum genetic gain include:-

a. Non mating of heifers to A.B.

Some farmers will not rear calves from first calvers because they fear their vigour is reduced. I recall a speaker at a field day in the late 1930's stating that his sister was a "heifer's" offspring and noting that she turned out alright! On most farms it is convenient to mate the heifers to a bull running with them. It overcomes the problem of observation when heifers are held in a remote area of the farm and often have short heat periods. The adoption of this practice means that approximately a quarter of the calves born are not suitable for rearing, which adds to the generation interval and slows improvement rates.

b. Lifestyles and ambitions of farmers

Some people are content to make a reasonable living and adopt a leisurely approach to their farming venture. They may not exert the necessary pressures to give rise to maximum genetic gain.

CONCLUSION

I have attempted to create a picture of the factors limiting selection of suitable breeding females in commercial herds. Wastages through herd health can limit this selection criteria and lead to the retention of inferior cows to maintain herd numbers.

These factors create the necessity to breed bulls to breed cows, so as to maintain and improve genetic merit.

I would emphasise the importance of adequate nutrition throughout the life of the cow. That is, growing "out" of young stock, ensuring an adequate condition through the dry period to calving, peaking production in early lactation and providing adequate, well-balanced rations as long as economically possible throughout lactation.

REFERENCES

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