“By 2020 we will see an upward swing in the use of hybrid vigour as the most powerful tool to add value to cattle,” says Lee Leeman, a stud breeder of Leachman Cattle in Colorado during a presentation at the Breedplan Stockman’s School in October last year. He believes that beef farmers should use cross-breeding to produce cattle that eat less but grow faster in order to meet the increasing demand for beef worldwide. He also says that terminal bulls should be used to ensure larger carcasses without making them larger. Furthermore he states that along with increasing fodder and fuel prices, feed efficiency is one of the most important economical characteristics. In tropical areas F1 (Brahman x Angus) produces 46% more kg calf per cow mated.

The question is therefore, what role can a breed such as the Bonsmara, which is a compound breed, play in cross-breeding to increase the efficiency of beef cattle production in Namibia? In order to make meaningful decisions regarding breed choice and appropriate breed strategies, producers are supposed to have extensive knowledge of breeds and their unique characteristics. It is estimated that Namibia has just more than 2 million cattle. An outstanding characteristic of the beef cattle industry is however that it consists of about 22 beef cattle breeds with which is produced extensively under difficult environmental conditions.

Cattle breeds can generally be divided into 2 species, namely:
1. Bos Taurus – Continental and British beef breeds of European origin.
2. Bos Indicus – Zebu cattle from Asia, India and Africa (hump and long ears).

However, breeds differ from each other in terms of characteristics such as size, fertility, muscling, milk production, calf size, carcass (lean or fat), tolerance and hair colour. With this, breeds can also be classified in terms of early-ripe (small frame) types or late-ripe (large frame) types. These terms refer specifically to the age at which carcass maturity is reached and fat deposition takes place, i.e. grading capacity.

**Characteristics of the Namibian beef farming environment**

The Namibian farming environment is characterised by the following factors:
- Low, volatile and poor rainfall (100 – 600 mm/year)
- 70% overgrowth of shrubs on traditional cattle farming land (approx. 26 mil ha).
- Sandy areas in the east and north east with yellow wood trees that have high carrying capacity but low quality.
- More hardy central parts with high quality but lower carrying capacity as it is very overgrown with shrubs.
- Hilly and mountainous western parts such as the Khomas Hochland etc. These areas have higher quality but lower carrying capacity.
- Marginal farming areas in the south.
- Low feeding and management levels in communal areas.

In essence therefore a hard extensive environment and nutritional status.

**Importance of crossbreeding**

Crossbreeding already plays a primary and an increasingly important role in commercial beef cattle production worldwide. Researchers believe that more than 70% of the meat produced in the world will be produced by crossbreeding systems in the future. It is estimated that more than 70% of commercial beef cattle in Namibia are produced from crossbred animals of which the most are Brahman-crossed animals. It is, however, concerning that survey studies worldwide indicate that most crossbreeding programmes are unplanned and inefficient. For Namibia the same concern is valid since the product of most crossbreeding systems end up in a degeneration of breeds.

The country therefore lacks the implementation of purposeful and well-planned crossbreeding strategies. Possible reasons for this is the lack of the following:
- Knowledge on breeds and their application
- Knowledge on crossbreeding systems
- Management skills
- Poor well-planned infrastructure
- Sufficient camps

The question can be asked why most researchers forecast that crossbreeding will be playing an increasingly important role in the production of meat? In terms of this, the practice (backed by research) shows that crossbred cows are more fertile, live longer and are naturally more efficient. Crossbred calves are also hardier and have a better survival ability as a result of a strong developed immune system. The reason for this is that crossbred cows develop a better immunity because of immunisation and therefore give their calves colostrum...
Crossbreeding therefore promotes characteristics such as age at first calving, fertility, and longevity. These characteristics are indeed not easily improved by means of selective breeding and selection within a pure breed. It is also these fitness traits that are low hereditary. It always has to be remembered that the performance of crossbred animals between Bos Taurus breeds and even 50% where Bos Taurus and Bos Indicus breeds are crossed.

Increased fertility in the case of Bos Taurus x Zebu crosses are mostly more where Bos Taurus and Bos Indicus breeds are crossed. In contrast to that, crossbred cows produce 32% more calves at 6% higher weaning weights which equalises or trumps the aforementioned advantage of pure cows.

Crossbred cows in general produce 25% more kg weaning weight than pure calves. They also grow faster, reach heavier weights and containing more antibodies. Crossbred calves are therefore healthier than pure calves. They also grow faster, reach heavier weights and contain more sub-optimal environments. Crossbreeding therefore promotes the fitness traits such as fertility, longevity and survival that is very hereditary. Characteristics that are highly hereditary such as post-weaning growth and carcass quality is, however, promoted less through crossbreeding.

This is the genetic advantage that the offspring shows by the mixing of their parent’s genes. The improvement of for example wean- ing weight is expressed by the percentage that the offspring weigh more than the average weaning weight of the parents.

Furthermore research worldwide shows that exceptional maternal ad
vantages are obtained by crossbreeding, namely:

- Crossbred cows are 8% more efficient than pure cows (more performance with less fodder).
- Crossbred cows live 38% longer than pure cows (longevity).
- Kg calf weaned per cow weight mated is approximately 23% high er in crossbred animals between Bos Taurus breeds and even 50% more where Bos Taurus and Bos Indicus breeds are crossed.
- Because pure cows are probably lighter, they need less energy in puts and therefore have a lower production cost per cow in the in the case of crossbred cows. In contrast to that, crossbred cows produce 32% more calves at 6% higher weaning weights which equalises or trumps the aforementioned advantage of pure cows.
- Crossbred cows in general produce 25% more kg weaning weight than pure cows (lifetime production is higher).

Crossbreeding therefore promotes characteristics such as age at first calving, fertility and longevity. These characteristics are indeed not easily improved by means of selective breeding and selection within a pure breed. It is also these fitness traits that are low hereditary. It always has to be remembered that the performance of crossbred animals is a function of the genetic merits of their parents. Therefore purchase pure animals, especially bulls, of which the estimated breed values (EBV) are available.

**CROSSBREEDING STRATEGIES FOR THE BONSMARA**

The Vaalharts and Omatjene studies indicate the Bonsmara is without a doubt ideal to use as motherline in terminal crossbreeding systems. The reason is that the Bonsmara possesses the following characteristics, which are a prerequisite for terminal crossbreeding:

- Adapted to the environment
  - High fertility (88%)
  - Easy calving (Birth weight relationship – 7.4%)
  - Sufficient milk to wean heavy calves (235kg)
  - Efficient (weaning weight relationship – 47%)

**CROSSBREEDING STRATEGIES FOR THE BONSMARA**

It is clear that the heterosis effect differs between areas. Research has shown that the heterosis effect is higher in sub-optimal environmen
tal conditions. This therefore makes crossbreeding the logical breed-
ing strategy in adverse breeding conditions, as is the case in Namibia. The optimum percentage of Bos Indicus or Sanga in crossbred animals should therefore be adapted to the climate and nutritional envir-

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**Eastern and north eastern areas are traditionally the cat-
tle farming areas:**

The eastern and north eastern farming areas in Namibia are known as the high potential areas (higher rainfall and carrying capacity). In these areas the following Bonsmara crossbreeding strategies should be experimented with:

- Bonsmara cows x terminal large frame beef breed bulls (Charolais, Limousin) – this produces offspring that show fast growth. All offspring should be slaughtered.
- Bonsmara cows x Brahman bulls – production of F1 adapted, smooth coat crossbred cows and you can utilise the heterosis of the Brahman.

**North western and western mountainous areas:**

The hardy and severe western and north western areas, such as the mountainous Khomas Hochland has relatively lower rainfall, but has higher quality grazing. The inhospitable terrain, as well as the amount of grazing available, are the restrictive factors in this area of the coun-

**Central areas known as the traditional rounding-off areas:**

The central areas, with an average rainfall have the more fertile ground but are heavily overgrown with shrubs. Grazing is of higher quality, but the carrying capacity is lower. Risks in terms of droughts are higher than in the eastern and north eastern areas. Here a medium frame adapted crossbred cow should increase production and the following crossbreeding strategy can be experimented with:

- Bonsmara cows x Brahman bulls – production of F1 adapted, smooth coat crossbred cows and you can