



Beef Production: The Basics

Beef Production Systems

Beef production systems are classified according to the age at which animals emanating from a production unit are sold. The production unit could be a farm or one of the enterprises in a larger undertaking. A full description of a system includes the age, mass and carcass class at which animals are marketed, as well as the breeding, management and feeding practices followed. In South Africa the most common beef production systems are weaner-, long yearling (tolly)- and two-year old (ox) systems. Buying-in systems are also commonly used, in which animals are bought, kept for a time during which they are usually fed to gain mass or condition, and then sold.

Although the name tolly or ox system implies that tollies (yearling oxen) or oxen (older oxen) are characteristically sold from the respective systems, it is noteworthy that surplus heifers of the same age are sold from these systems at the same time as the relevant male progeny.

In Addendum A, examples of beef stock flows for weaner, tolly and ox systems are reflected. The herd composition of these stock flows are summarised in Table 1. A study of this data shows that weaner systems are basic to beef production *i.e.* are the "engine room" of beef production. After all, beef production is based on cows, which are bred and produce calves. A weaner system is therefore the cow herd run on one farm and the progeny are moved elsewhere for further processing, in contrast to tolly and ox systems where further processing takes place on the same farm.

The herd compositions reflected in Addendum A are idealised (theoretical) structures and the percentage herd compositions reflected in Table 1 are the average for the year, whereas herd composition changes from time to time, especially at weaning and when progeny are sold. This must be taken into account when considering the implications of herd composition, especially when considering real herds. As a general rule of thumb, in weaner systems the cow herd comprises approximately 60% of the total AU's of a herd and in tolly and ox systems the equivalent values are 50% and 40% respectively.

Table 1. Herd composition of weaner, tolly and ox beef production systems each comprising 100 breeding cows, expressed as animal units (AU).

Sub-class	Weaner		Tolly		Ox	
	AU	% of total herd AU	AU	% of total herd AU	AU	% of total herd AU
Bulls	4.8	2.9	4.8	2.5	4.8	1.9
Dry cows	22.8	63.1	22.8	54.6	22.8	42.7
Lactating cows	66.4		66.4		66.4	
First calf cows	16.8		16.8		16.8	
Calves	18.5	11.0	18.5	9.5	18.5	7.4
Rpl heifers (yearling)	15.1	23.0	15.1	20.0	15.1	15.6
Rpl heifers (two-year old)	18.6		18.6		18.6	
Rpl heifers (point of calf)	5.0		5.0		5.0	
Heifers (yearling)			8.9		17.9	
Steers (yearling)			17.1	13.4	34.4	21.1
Heifers (two-year old)					9.6	
Steers (two-year old)					18.4	11.3
Total AU	168		194		248.3	

Factors to consider in deciding on a production system

Profitability

There is still controversy as to which is the most profitable beef production system although a number of studies have been undertaken in an attempt to determine this. What has been shown is that specific circumstances favour one or more production systems **e.g.** when feedlots are making a profit, feeders achieve good prices. Beef prices change in a cyclical fashion, with a rapid increase in carcass prices over a relatively short period, followed by a longer period during which the beef price remains relatively constant. Early in the beef price cycle the price of weaners is relatively high, resulting in very good profit margins for weaner producers, whereas weaner prices are usually relatively low toward the end of the cycle or if prices remain stagnant.

When the circumstances under which a system is functioning change, profitability changes. A problem facing beef farmers is that, apart from buying-in systems, changing a beef production system is time consuming. Circumstances tend to change in a cyclical pattern and profitability tends to follow the same trend. Trying to keep ahead of changes can be very costly and often fails because markets change more rapidly than it is possible to

change a beef system and the cycle tends to repeat itself over time. A middle of the road approach, staying with a tried, tested and familiar system, often provides the best solution.

Fodder flow

Beef farming can be run under intensive conditions, but low returns and relatively stagnant beef prices during the early part of the nineties has favoured beef farming enterprises run under extensive conditions where veld (natural grazing lands) is the main source of feed for the cattle. Whether the beef production system is run under intensive or extensive conditions, matching the fodder requirements of herds on a farm to the fodder produced reduces input costs.

Climate

In very hot or excessively cold climates, breeds adapted to the relevant environments have an advantage over cattle not accustomed to extremes of temperature. Under moderate environmental conditions, assuming suitable management, most breeds of cattle are able to cope with the climate.

Weaner systems contain a high percentage of breeding cows. This makes weaner systems relatively inflexible and poorly suited to areas prone to periodic droughts, whereas with ox systems, cattle *i.e.* the oxen and surplus heifers (some farmers prefer to keep surplus heifers and sell cows), can be sold during periods of drought to reduce feed requirements, without having to sell breeding cows. With weaner systems, when numbers must be reduced, breeding cows must be sold and buying in good quality breeding cows after a drought is difficult and very expensive.

Where rainfall is very low and erratic, it could be advisable to commit a part of the farm to a buying and selling system. During years when rainfall is poor, cattle are not bought and the relevant part of the farm can be used to graze home-bred cattle.

Available markets and transport

Market prices and distance to market must be taken into account when deciding on a beef production system for a specific farm. Unfortunately, fluctuations in market price are difficult to follow by changing production system, and reliance must be placed on evaluating the market over past long term periods with the aim of developing a system which will provide the best average profit over future long term periods. The periods evaluated should stretch over years and not months. Chance therefore plays a significant role and luck in addition to experience and a thorough knowledge of beef markets are necessary to provide the correct solution.

Transporting cattle over long distances to markets increases input costs. Where cattle are transported to abattoirs for slaughter, bruising of carcasses, stress, and diseases like transit fever, result in financial losses which can be reduced by good management, but cannot be eliminated.

An argument often raised is that it is cheaper to transport carcasses than live animals and it has been demonstrated in the USA that it is more profitable to erect abattoirs in beef producing areas rather than in consumer areas, which are often far away from the beef farming areas. In South Africa the distances between producer areas and consumer areas are usually not as vast as in the USA and, based on local research, it can be accepted that as long as the distance that cattle must travel to abattoirs does not exceed 400km, the role of distance to market will not be as significant as it is in the USA.

Efficiency of production

Conception rates are often taken by farmers as an indicator of efficiency, however conception rates are based on pregnancy diagnosis, which can be inaccurate. Calf mortalities from birth to weaning render birth rate a less efficient indicator of production efficiency than weaning rate. Weaner systems are known to be very prone to depressed profit margins when the number of weaners produced per annum is low. Unless at least a 75% weaning rate is achieved without excessive feeding, weaner systems should not be contemplated. It is doubtful if any system can make a profit with weaning percentages below 65%.

Other enterprises on the farm

Where the beef unit is a secondary enterprise, efficient management of the cattle could be limited by a lack of time. A weaner system would then be inadvisable. On the other hand, where grain crops are produced, the grain could be a source of cheap feed for a feedlotting enterprise, time permitting.

The availability of relatively cheap cattle feeds, either bought-in or home-produced, for growing out and fattening livestock could provide the means for cost-effective on-farm feedlotting. Buying in feeders in addition to home-grown livestock, should then be considered. On the other hand, when feedlot rations are relatively expensive, veld finishing older cattle would be advisable *i.e.* ox systems in sweetveld areas.

Size of farm and extent of development

Tolly and ox systems comprise more herds than weaner systems and usually need more paddocks and watering points to run efficiently. Where a farmer is starting a beef enterprise, weaner systems are often used because paddocks are still in the process of development, and because livestock sales can commence earlier, funds to develop and run the enterprise are available sooner.

A weaner system could be favoured on smaller farms which are not intensively cultivated because a lower work load allows better supervision, especially when cattle numbers are small.

Personal choice

Personal preference must not override sound economic considerations or limitations of a farm. However, people are motivated to work harder for systems they like and prefer.