The South African Society for Animal Science (SASAS) recognizes the effect of livestock on Greenhouse Gas (GHG) production and climate change, and it is important that through research, methods are developed and put in place to mitigate this effect. The livestock industries should also recognize the effect of livestock on climate change and actively support strategies to mitigate it.

It must be remembered that ruminants are important to mankind since most of the world’s vegetation biomass is rich in fibre. Only ruminants can convert this high fibre containing vegetation into high quality protein sources (i.e. meat and milk) for human consumption and this will need to be balanced against the concomitant production of methane.

Despite this important role of livestock, these animals are specifically being targeted and singled out as producing large quantities of Greenhouse Gasses that contribute to climate change, since enteric fermentation is responsible for 28% of global methane emissions. The consequence is that many consumers may decide to reduce their consumption of red meat. The popular press is fuelling these sentiments with slogans telling consumers to eat less meat.

With this statement the Council of SASAS hopes to present a balanced view to ensure that the public is properly and correctly informed about the impact of livestock on GHG production and climate change.

Below please find some specific statements in this regard.

**Climate change**

Climate change is expected to have a more extreme effect on southern hemisphere continents than on other continents and the anticipated global warming is expected to have a negative effect on the livestock production environments of these countries.

Tropical and subtropical climates have both direct and indirect effects on livestock. Factors such as temperature, solar radiation, humidity and wind all have direct effects on animals, whereas factors such as digestibility of feed, intake, quality and quantity of grazing, pests and diseases, which are themselves directly influenced by climate change, all have indirect effects on animals. It is predicted that climate change will have negative effects on the African continent. These negative effects will include high ambient temperatures, nutritional stress and altered patterns of animal diseases. An improved understanding of the adaptation of livestock to their production environments and how the vegetation is going to change as a result of climate change is therefore essential.
Greenhouse gas emissions by livestock

There is a general perception that livestock is a major contributor to global warming. This is the result of a FAO publication, Livestock’s Long Shadow in 2006, which indicated that livestock is responsible for 18% of the world’s methane production. This figure has since been proven to be a gross overestimation of the contribution of agriculture. The most recent figure is in the order of 5-10% (also for South Africa) of which livestock contributes about 80-90%.

Having said that, to quote a percentage does not make sense: In industrialized countries the figure for agriculture is less than 6%, simply because the contribution of their energy sectors, mines, etc. to GHG emissions is so big. In non-industrialized countries the figure for agriculture can be 40-50% and yet that contribution is less than the 6% of the industrialized countries. If one now estimates mitigation options it is obvious that a 10% reduction in the energy and mining sectors make much more sense than a 10% reduction in the 5-10% contribution of agriculture. So, the “meat free once a week” argument will not do much to rectify the problem. This can be substantiated from the literature. It is interesting that transport costs are added when GHG emissions are calculated for livestock but not for the other sectors.

Intensively fed cattle produce more GHG than cattle on the veld/pasture.

This is simply not true. GHG emission from livestock is measured either in terms of kg CO₂ equivalent per kg of meat or milk available for consumption, or per area of land used. In the case of ruminants extensive systems are usually found to have a lower per-area footprint than intensive grain-fed systems, but a higher footprint if expressed in terms of kg product.

Cattle in feedlots fatten over approximately 110 days in South Africa, which means that they produce GHG for only 110 days before they are slaughtered. For cattle on veld/pasture it requires more than 200 days to fatten because of the lower quality feed compared to a feedlot diet. Furthermore, the lower quality feed (mainly pastures that they are consuming) also produces more GHG per kilogram feed intake than the concentrates used in feedlots. The bottom line is that feedlots maximize efficiency of meat production resulting in a lower carbon footprint.

Furthermore, there is substantial evidence indicating that organic production systems consume more energy and have a bigger carbon footprint than conventional production systems. For example, organic grass-fed cattle requires approximately three times more energy per kilogramme of weight gain and release more than double the quantity of GHG’s per kilogramme of weight gain than conventional feedlot cattle. Most consumers purchasing organic products do not know that it has a higher carbon footprint.

Cows on pastures produce more methane than cows on a high concentrate diets. At a recent World Congress, it was concluded that increasing cow efficiency, i.e. maintaining milk output by fewer animals, reduced farm methane production by 15%. The way to reduce methane from cattle is to reduce their numbers and increase the production per animal. A study in the USA indicates that the carbon footprint per kilogramme milk produced in 2007 was only 37% of that produced in 1944. Thus
the carbon footprint of milk that is currently produced is 63% smaller than the mostly organic production systems of 1944.

**Water used to produce meat should rather be used for grain or vegetables**

This statement relies on the assumption that all water sources, whether provided through rainfall or by irrigation, are of equal value and equally available to be utilized for different purposes. For example, how are you going to get the water from rain in the areas that is unsuitable for crop and vegetable production (and in South Africa this is 70% of the land) to areas where crops and vegetables can be planted? The challenge will be to get the water out of the ground in order to use it. The vegetation in these areas is also going to absorb some of the water, whether it is utilized by animals or not. If this vegetation is not utilized by animals, it will either burn or rot and both will produce large quantities of GHG’s. In practice it may not be possible to reclaim and transport the water, or if possible, it may not be economically viable. This implies that the argument is rather futile from an implementation point.

**Eat grains (and vegetables) instead of meat**

Animal products contain crucial nutrients, like vitamin B12 that is only available in animal products and some yeasts. Vitamin B12 is required to produce red blood cells and a healthy nervous system. Diets without vitamin B12 can also lead to nerve damage and impaired vision. Furthermore, the grain / beef argument implies competition for resources and that one can be substituted for the other. Grain primarily supplies energy and beef supplies protein and certain minerals and vitamins, which are essential for healthy living. Meat (all animal food products) is nutrient dense, whereas vegetables (and grains) are not. This means one needs much higher volumes and sometimes also supplements to have equal substitution value. The GHG’s involved in the production, packing and transport these supplements may be higher per unit of supplement than that of meat. Furthermore the practical viability to do so has not been evaluated.

**Substitute livestock with grain and vegetables to feed people**

This implies that all sources of food production require a similar and equal quantity and quality of resources. This is a futile and invalid point of departure. Large regions are completely unsuitable for growing grains or vegetables. Animal production is the most sustainable way of food production in these areas. In South Africa, as in most of the countries in the sub-tropics, livestock production is the only option on about 70% of the agricultural land. This is because of marginal soils and rainfall that do not allow crop production. If one were to do crop production, it would mean heavy investment and unsustainable use of resources.

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