

## CHAPTER 4

### THE VALUE CHAIN FOR RED MEAT

#### 4.1 Introduction

In South Africa, stock farming is the only viable agricultural activity in a large part of the country. Of the 122.3 million hectares of land surface of South Africa, 68.61% is suitable for raising livestock, particularly cattle, sheep and goats.

The red meat industry evolved from a highly regulated environment to one that is totally deregulated today. Various policies, such as the distinction between controlled and uncontrolled areas, compulsory levies payable by producers, restrictions on the establishment of abattoirs, the compulsory auctioning of carcasses according to grade and mass in controlled areas, the supply control via permits and quotas, the setting of floor prices, removal scheme, etc., characterised the red meat industry before deregulation commenced in the early 1990s (Jooste, 1996). Since the deregulation of the agricultural marketing dispensation in 1997, the prices in the red meat industry are determined by demand and supply forces.

Also, the meat industry experienced dramatic price increases during 2002. In this Chapter, the focus is on the beef sub-sector to determine whether these price hikes were due to normal market forces, to exchange rate fluctuations, or to some other forces not characteristic of a totally deregulated industry.

In order to source the data required for the analysis of margins and the food-to-retail price spreads, interviews were conducted with all major role players in the beef industry, i.e. the South African Feedlot Association, the Red Meat Abattoir Association, the Red Meat Producers Organisation, and retailers.

Information regarding enterprise budgets was sourced from the Provincial Departments of Agriculture, different co-operatives and selected feedlots.

The information sourced was used to describe the beef cost chain from farm level to retail level. In addition, those factors that might have had an influence on the different cost components were to be investigated with the aim of gaining a better understanding of those factors that have an influence on the profit levels of the different role players in the supply chain.

#### 4.2 Structure of the red meat industry

Figure 4.1 shows the structure of the red meat supply chain. Important developments in recent years in the beef industry are the following:

€# The beef supply chain has become increasingly vertically integrated. This integration is mainly fuelled by the feedlot industry where most of the large feedlots own their own abattoirs, or at least have some business interest in certain abattoirs (This issue will be discussed in more detail in a subsequent section). In addition, some feedlots have integrated further down the value chain and sell directly to consumers through their own retail outlets. Some abattoirs have also started to integrate vertically towards the wholesale level.

- €# Under the previous marketing regime, wholesalers mostly bought carcasses through the auction system. Currently, many wholesalers source live slaughter animals (not weaners) directly from farmers or feedlots on a bid and offer basis, i.e. they take ownership of the animal before the animal is slaughtered. The animal is then slaughtered at an abattoir of the wholesaler's choice, where after the carcass is distributed to retailers. In some instances, the public can also buy carcasses directly from wholesalers.
- €# The abattoir industry has expanded tremendously in number and in capacity. In this regard, it is important to note that this industry can be divided into those abattoirs that (i) are linked to the feedlot sector and the wholesale sector, or are owned by municipalities and (ii) those that are mainly owned by farmers and SMME's. The former abattoirs are mainly class A and B abattoirs, whereas the latter are usually classified as C, D and E class abattoirs. According to Davidson (2003) the A and B class abattoirs, in most cases, comply with all statutory measures, whilst it is questionable whether this is the case for the majority of C, D and E class abattoirs. This, obviously, has a cost implication, which affects profit taking at abattoir level. This issue, however, is not the subject of this Chapter and will, therefore, not be discussed in further detail.

#### **4.2.1 Number of primary producers and concentration**

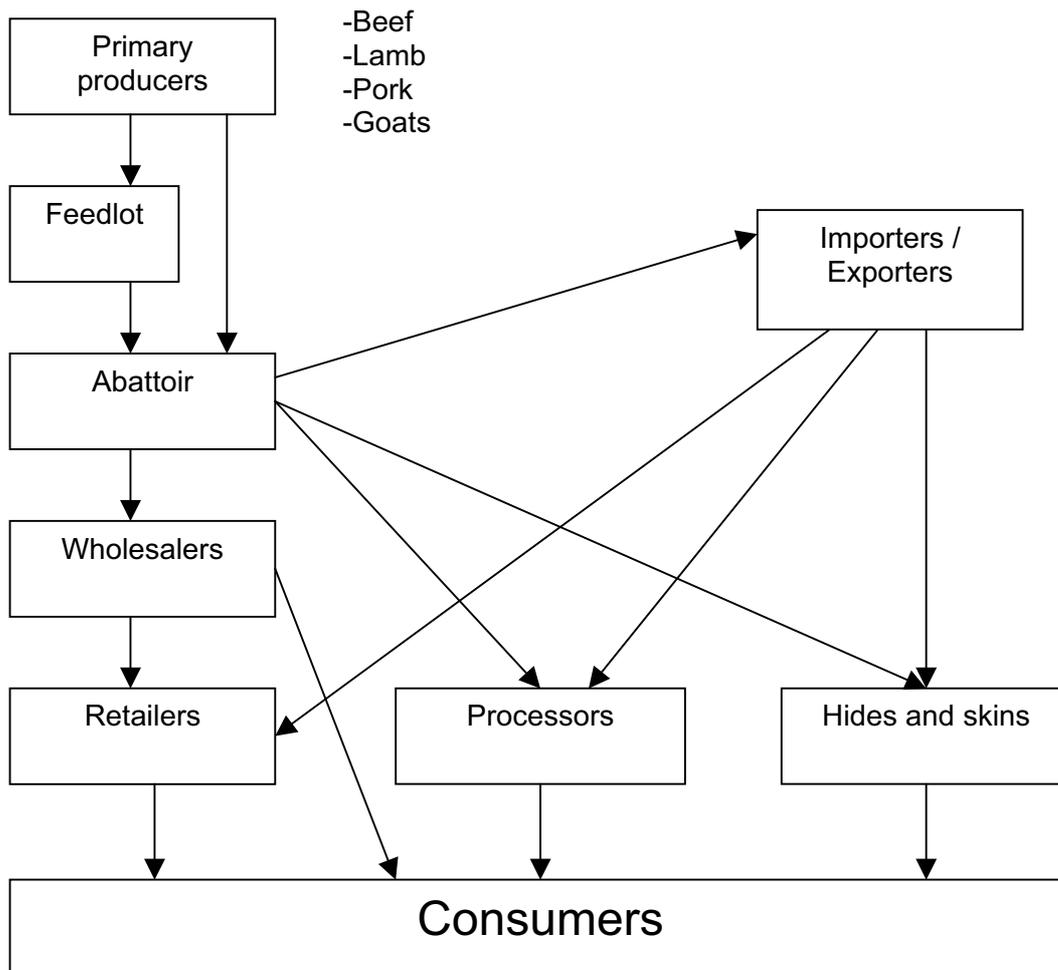
It is estimated that there are approximately 20,000 to 25,000 commercial farmers currently farming with livestock (Schutte, 2003). This includes producers that keep livestock as their main enterprise and those that keep livestock as a secondary enterprise. Numbers for small-scale or subsistence farmers are not available, but in the case of cattle it is estimated that between 30 and 40% of the total herd is owned by these farmers.

Due to typical production cycles, the fact that producers have to contend with extreme climatic variances and the biological nature of beef production, they are not in a position to manipulate the market in any way. Producers in the red meat industry, as is the case in any other industry, are rational decision-makers reacting to market and climate conditions.

Determining whether economies of scale are present in the red meat industry is nearly impossible since farmers usually have mixed enterprises. Nevertheless, it is generally accepted that large producers have better economies of scale than small producers do. The reason for this is that large producers have better bargaining power when it comes to the sale of animals or to the purchasing of inputs, whilst their throughput is also higher. This will, however, also depend on the production system in use, e.g. the weaner production system vs. the slaughter steer production system<sup>1</sup>.

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<sup>1</sup> A producer using weaner systems is focused on selling offspring at weaning age to mainly feedlots. Producers using oxen systems raise their cattle on the farm until they are ready to be marked for the consumer market.



**Figure 4.1: The red meat industry structure (Value chain)**

*Source: Adopted from SAFA, 2003.*

#### 4.2.2 Feedlots

The feedlot industry produces approximately 70 to 80% of beef in the formal sector in South Africa. At any point in time, it is estimated that this sub-sector has a standing capacity of 420,000 heads of cattle. This entails that this industry has a potential throughput of 1,512 million animals annually. Animals normally enter the feedlot system at a mass of between 200 and 220kg and remain in the feedlot for approximately 100 days. During the time in the feedlot, the animal adds approximately 100kg to its original weight, which realises a carcass weighing between 220 to 225 kg. The amount of beef produced annually by feedlots amounts to approximately 340,000 tonnes and the total amount of feed used by the feedlot industry annually amounts approximately 1,5 million tonnes (SAFA, 2003).

As mentioned above, the deregulation of the South African meat industry caused a number of the larger feedlots to vertically integrate into the slaughtering of their own cattle, and into wholesaling. A few even branched out into retailing their own branded quality beef products.

### *Analysis of selected food value chains*

At present, there are approximately 70 feedlots in South Africa. The main players in the feedlot industry are Karan Beef, Kolosus, Sparta Beef, SIS, Beefcor, EAC, Crafcor, Chalmar Beef and Beefmaster (Ford, 2003). These feedlots account for approximately 70 to 80% of the cattle in the feedlot industry, depending on the number of animals standing in the feedlot at a specific point in time (see Table 4.1). This is between 50 and 60% of the total number of animals slaughtered annually.

**Table 4.1: Main players in the feedlot industry\***

<b>Name</b>	<b>Location</b>	<b>Number of animals at any specific time</b>
Karan Beef	Heidelberg	70 000
Kolosus/Vleissentraal	Potchefstroom Magaliesburg	40 000
EAC Group	Sasolburg Harrismith Bethlehem	35 000
Beefcor	Bronkhorstspuit	25 000
Chalmar Beef	Bapsfontein	15 000
Sparta Beef	Marquard	40 000
Beefmaster	Christiana	20 000
Crafcor	Cato Ridge	30 000
SIS	Bethal	22 000
<b>Total</b>		<b>297 000</b>

\* *The figures represented in this table do not necessarily reflect the capacity of the respective feedlots. The figures approximate the average numbers standing at the respective feedlots at a specific point in time. It is common for these figures to show large variations, depending on market conditions.*

The feedlot industry is also characterised by farmer feeders or seasonal feeders that enter or exit the market when it suits them, usually at the end of the year when meat prices are higher. The majority of feedlots are located in the grain producing areas or where access to grain by-products is possible.

### *Economies of scale*

The feedlot industry in South Africa is struggling to realise economies of scale. The total cost of the final carcass comprises the purchasing price of the weaner (53%), the price of feed (37.4%), overheads (5.3%), mortality and morbidity (0.5%) and marketing (3.8%) (SAFA, 2003).

One of the reasons for this state of affairs is that the feedlot industry is a biological production system supported by a relatively high degree of capital layouts<sup>2</sup>. For example, market-ready animals cannot be withheld from the market when prices are low. The market discriminates against both over-fat and heavy carcasses, and thus, cattle have to be slaughtered when they are ready regardless of the ruling market price. Also, in order to realise the best positive feeding margin, feedlots aim to operate at optimal capacity. Thus, when a feedlot requires feeder calves to fill the vacant pens, it has to purchase calves at the going market price even though this price may be unfavourable.

<sup>2</sup> Feedlots must keep animals in the feedlot for approximately 90 to 100 days, during which time they are fed intensively. This entails high initial capital cost (purchasing of weaners) and continuous capital (purchasing of feed) layouts before the feedlot realises any profit.

The location of a feedlot also influences its ability to maintain or improve economies of scale. For example, as feedlots attempt to reach standing capacity, the further afield they source animals from producers, the more they have to contend with competitors (other feedlots and private feeders). This results in higher capital outlays. The same applies to the procurement of feed, i.e. the more feed that is required, the further afield the feed must be bought, the greater the cost of procurement will be.

Cognisance should also be taken of the fact that profits are very sensitive to production and marketing inefficiencies. If an animal is classified wrongly and slaughtered, it could reduce the income from that animal by as much as R200 to R220. This is a significant amount if one considers the size of the big feedlots. It is for this reason that large amounts of money are invested in human capital to overcome inefficiencies within the feedlot industry.

*Barriers to entry and exit*

Any farmer, however big or small, can feed cattle intensively in a feedlot and enter the market at his/her own discretion. Establishing a feedlot as a going concern is, however, highly capital intensive, and feedlot operators are highly dependent on a proper cash flow. Commercial enterprises that have investments in fixed assets would find exit difficult, as there is no market for second-hand feedlot material. Hence, the only real avenue for exit is to sell the feedlot as a going concern.

**4.2.3 Abattoirs**

Official numbers of registered abattoirs at the Red Meat Abattoir Association (RMAA) are shown in Table 4.2. It is clear that only 40% of all slaughterings are performed by abattoirs that may slaughter an unlimited number of animals. Adding to this the number of Class B abattoirs means that approximately 60% of cattle are slaughtered by highly regulated abattoirs.

**Table 4.2: An overview of the abattoir industry**

Class	Slaughter units*	Number of abattoirs	Estimated slaughtering per Class (%)
A	100+	33	40
B	50-100	38	20
C	15-50	38	15
D	8-15	70	15
E	< 8	162	10

\* 1 cattle = 1 horse = 3 weaners = 5 pigs = 15 sheep

\*\* It should also be noted that there could be at least 80 Class E abattoirs more than official statistics suggest.

Source: RMAA, 2002.

As mentioned previously, most of the Class A and B abattoirs have some linkages with feedlots. It is estimated that 60% of the 80% of animals going through feedlots are slaughtered by vertically integrated abattoirs. Table 4.3 gives an indication of the level of vertical integration up to abattoir level.

**Table 4.3: Vertical integration up to abattoir level by selected feedlots**

<b>Feedlot</b>	<b>Abattoir</b>
Karan Beef	Balfour
Crafcor	Cato Ridge
SIS	Witbank
EAC	Vereeniging, Wolwehoek and Harrismith
Beefmaster	Kimberley
Sparta Beef	Welkom
Beefcor	Krugersdorp
Chalmar Beef	Bapsfontein
Kolosus	Bullbrand

Over the years, the so-called “service” abattoirs have reduced substantially (Neethling, 2003). This type of abattoir mainly provides a slaughter service to other role players that have ownership of cattle, for example, wholesalers may buy cattle directly from farmers and use ‘service abattoir’ of their choice to perform the slaughter service at a specified fee. Currently, only two of these abattoirs are in operation, namely in Maitland and Waterberg. This does not mean that other abattoirs no longer provide the service, but that the extent of this service has reduced substantially. It is estimated that between 5 and 10% of cattle are slaughtered on a “service” basis.

#### *Economies of scale*

Before the deregulation of the red meat market the distinction between controlled and uncontrolled areas contributed largely towards asymmetric slaughtering of animals, in favour of large contract abattoirs in the controlled areas. In other words, producers could only sell their animals in controlled areas if they were slaughtered there. The large contract abattoirs benefited very much from this. The distinction between controlled and uncontrolled areas was discontinued during the deregulation process, however, resulting in many new and smaller abattoirs in traditional beef producing areas. Thus, producers could now slaughter their animals where they saw fit, and transport the meat to previously controlled areas.

This resulted in substantial financial losses for the previously advantaged abattoirs, and caused many of them to close down, for instance, City Deep in Johannesburg. The overhead costs of the smaller abattoirs are substantially lower than those of the large contract abattoirs. This means that the former reach economies of scale in a relatively short time. Maintaining such economies of scale is also much easier, in the sense that smaller abattoirs can respond much faster to changing market conditions, particularly with respect to slaughter tariffs offered to producers.

### **4.3 Trends in production, consumption and trade**

#### *Beef production*

Figure 4.2 shows the South African cattle herd and the number of animals slaughtered annually since 1973. The commercial cattle herd comprises approximately 65% of the total cattle herd. This means that approximately 35% of all cattle in South Africa are owned by non-commercial farmers. Sixty-eight% of the commercial herd comprises

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female animals, of which the majority is for meat production. The composition of the national herd is not expected to change significantly in the near future. The main feature depicted in Figure 4.2 is the cyclical trend in herd numbers. Lubbe (1990) states that the cyclical behaviour of beef supply is attributable largely to the cyclical behaviour of female slaughtering.

The main contributor to this phenomenon is climatic conditions. The Sunnyside Group (1991) estimated the correlation between national herd numbers and the three-year moving average of rainfall at 0,62.

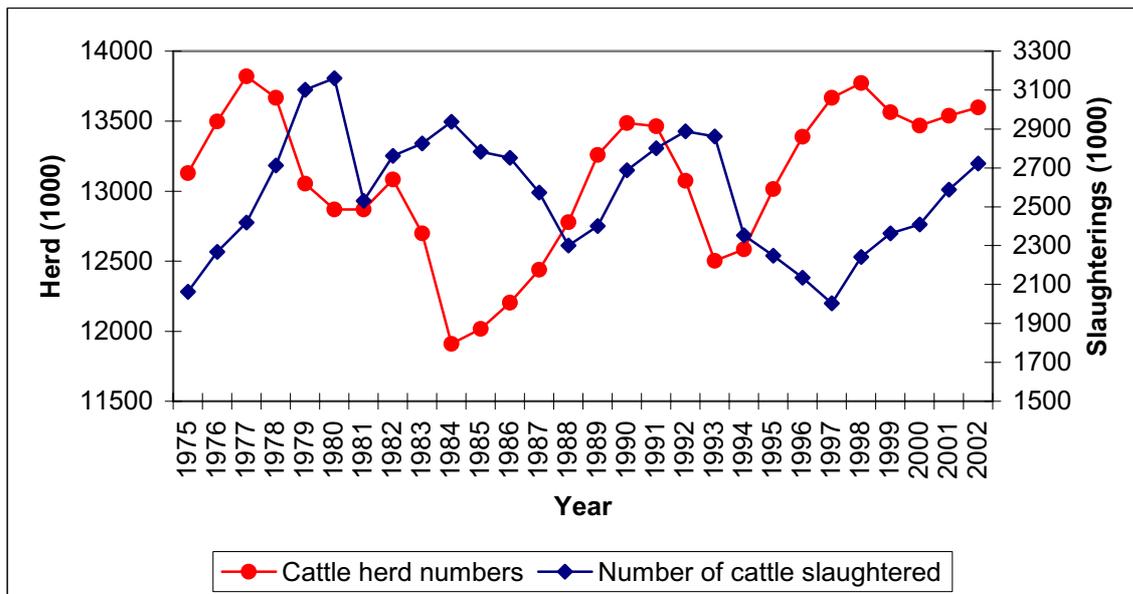


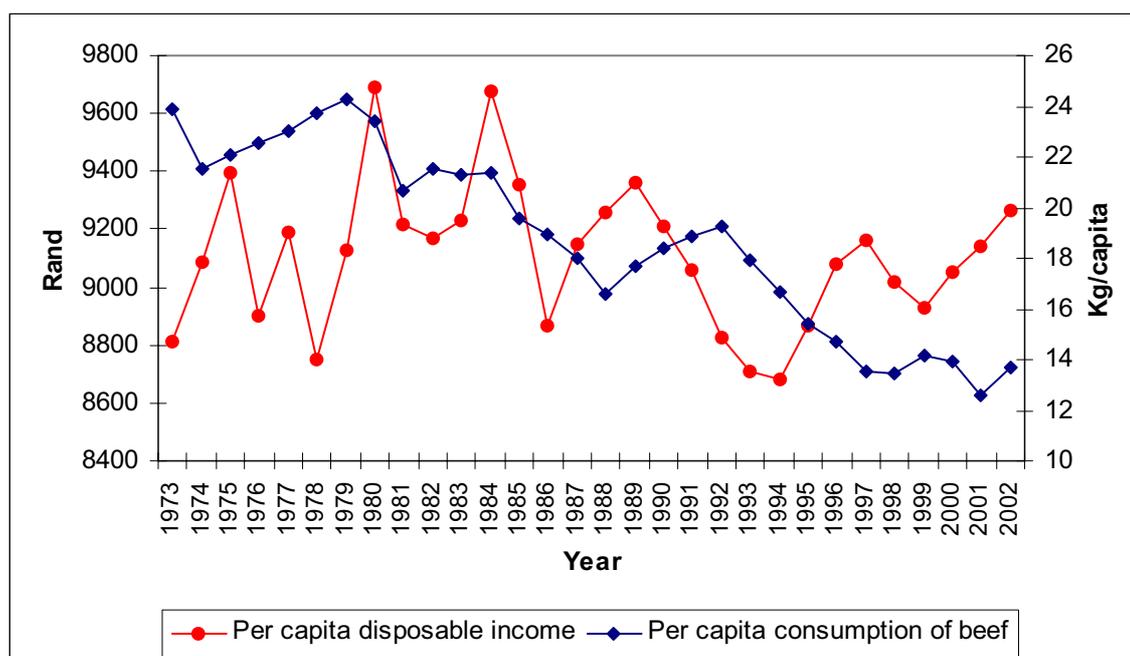
Figure 4.2: The South African cattle herd and slaughtering (1975 - 2002)

Source: AMT, 2003; NDA, 2003.

Availability of beef in the formal sector amounts to an average of 475,000 tonnes, per annum. This is based on an estimated annual slaughter of 1,95 million cattle. It is further estimated that slaughtering in the informal sector could amount to a further 20 to 25% for cattle.

Consumption

The per capita consumption of beef has been under increasing pressure since the early 1980's (See Figure 4.3). This is mainly attributed to the decrease or stagnation of the per capita disposable income, the price advantage of poultry over beef, and the influence of non-economic factors such as product consistency and quality, food safety, health and nutrition concerns, and convenience (Jooste, 2001). The per capita disposable income and beef consumption are very closely linked. This is emphasised by the fact that beef has a high income-elasticity of demand (Nieuwoudt, 1998).



**Figure 4.3: Relation between real per capita disposable income and the per capita consumption of beef (1973 - 2002)**

*Source: SARB, 2003; NDA, 2003; own calculations.*

A review of the total expenditure shares of four animal protein sources (beef, chicken, pork and mutton) for South Africa from 1970 to 2000 has indicated that the total expenditure on beef and mutton showed the largest decrease. Total expenditure on pork decreased slightly over the last 30 years, whereas the total expenditure on chicken experienced the largest increase.

Table 4 shows the real per capita expenditure on red meats by different population groups for 1993 and 1999. The methodology used to calculate the real per capita expenditure on red meats is similar to that used by Nieuwoudt (1998). Nieuwoudt used a system of two equations to estimate rural and urban per capita expenditure per population group (see Nieuwoudt 1998 for the methodology used).

Table 4.4 shows that real per capita expenditure for beef, pork and sheep meat has declined since 1993. Beef, followed by sheep meat and then pork experienced the largest decline in per capita expenditure. In terms of the total population, per capita expenditure on beef is still the highest. Whites spend the most on beef, followed by Blacks in urban areas, but it is important to note that the real per capita expenditure by both declined considerably between 1993 and 1999. In the case of sheep meat, Asians spend the most, followed by Whites and then Coloureds. Also, note the decline in real per capita expenditure by especially Whites and Asians. Real per capita expenditure on pork is dominated by Whites, followed distantly by the other population groups. It is interesting to note the increase in the per capita expenditure of Blacks in rural areas for all three red meats. This could probably be attributed to increases in real income from a very low base.

**Table 4.4: Real per capita expenditure on red meat in South Africa**

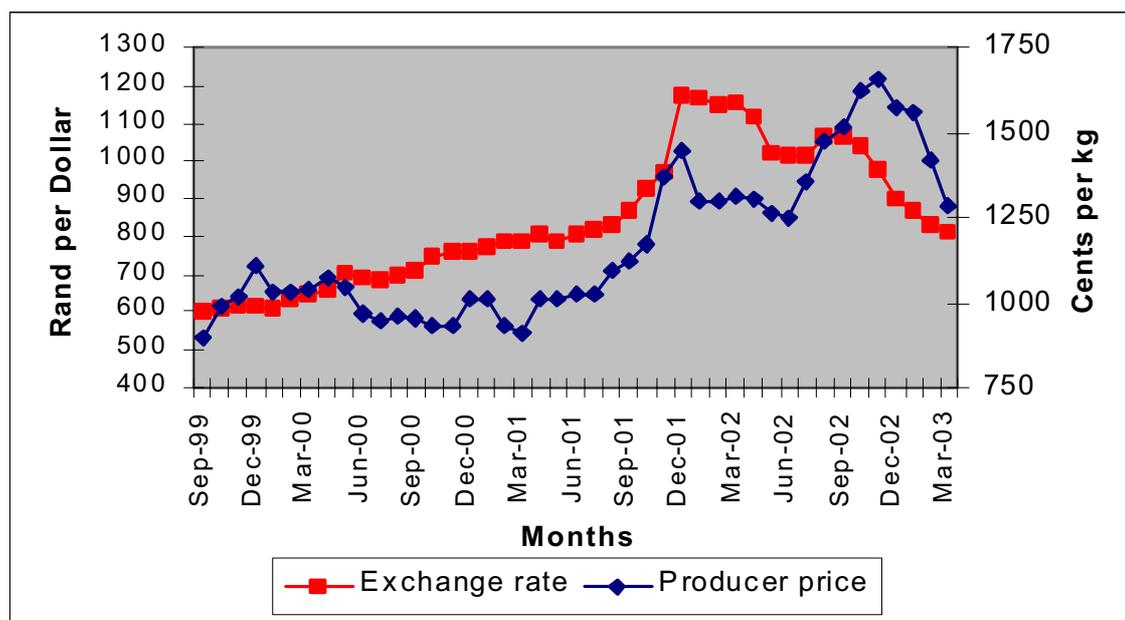
Population group	Beef		Sheep meat		Pork	
	Rand per capita (1993 = base period)					
	1993	1999	1993	1999	1993	1999
Asians	179.73	115.47	396.20	280.80	17.81	25.14
Blacks (urban)	223.00	136.45	65.48	53.12	18.25	19.95
Blacks (rural)	53.57	71.85	15.73	27.97	4.38	10.51
Coloureds	203.55	105.58	158.19	144.69	33.45	29.23
Whites	540.30	325.34	303.56	245.00	139.91	120.04
Total population	187.53	127.38	91.29	77.33	29.35	27.74

Source: Jooste, 2001

### Trade

South Africa is a net importer of beef. Beef imports from overseas underwent a substantial increase since 1994, averaging more than 40,000 tonnes annually up to 1998. Since 1998, beef imports have been between 15,000 and 20,000 tonnes, annually. The decline in beef imports since 1998 is probably attributed to:

- ⌘ Clamping down on fraud by exporters together with a new tariff dispensation for beef.
- ⌘ The advent of BSE in Europe in 1998 resulted in a ban on all exports of beef. This ban resulted in international shortages of red meat. Countries, such as Australia and New Zealand, experienced a huge increase in demand for their safe meat, resulting in price increases for these commodities. In addition, Foot and Mouth Disease broke out, not just in South Africa, but also in most countries in South America. Consequently, the imports of beef came virtually to a stop. Also, Namibia and Botswana achieved record prices in the EU for their safe beef and reduced the volumes to South Africa.
- ⌘ A substantial depreciation of the Rand against the US Dollar since 1998. Figure 4.4 shows the producer price for beef and the exchange rate.



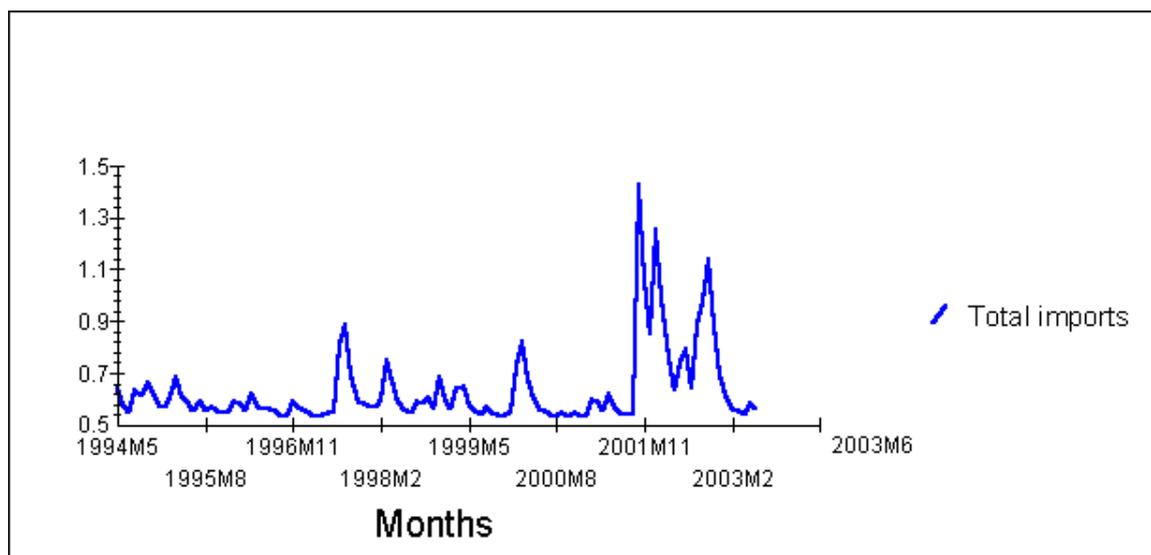
**Figure 4.4: The producer price for beef and the exchange rate**

Source: AMT, 2003; SARB, 2003.

It is clear from Figure 4.4 that there is a strong correlation between the producer price of beef and the exchange rate. Cognisance should be taken of the fact that prices of beef usually peak during the festive season, i.e. from November to December, after which they decline, bottom out and reach a peak again the following season. These peaks coincided largely with the peaks of the R/\$ exchange rate in 2001 and 2002. This meant that imports were relatively expensive during periods of high seasonal demand because of the low value of the Rand against the US Dollar, and this further supported local beef prices.

All these factors led to imported meat either not being available, due to disease problems, or not being affordable. For example, during 2002 the total meat imports dropped to about 50 000mt compared to 144 000mt in 2001.

During October and November 2002, the OIE approved the Foot and Mouth Disease measures taken by most of the South American countries. South Africa soon followed suit, and in late December 2002, imported beef arrived in South Africa from Brazil and Argentina. More containers arrived in January and February 2003. At present, there is too much stock available and this not only has forced down the prices of local production but also the prices of imported meat. The strengthening of the Rand has also stimulated imports (Papendorf, 2003) as reflected in Figure 4.5, which shows the volatility in total imports. It is clear that volatility in imports increase substantially from the latter part of 2001 onwards.



**Figure 4.5: Conditional standard deviation of total beef imports (1994 – 2003)**

#### 4.4 Price trends

##### *Producer price trends*

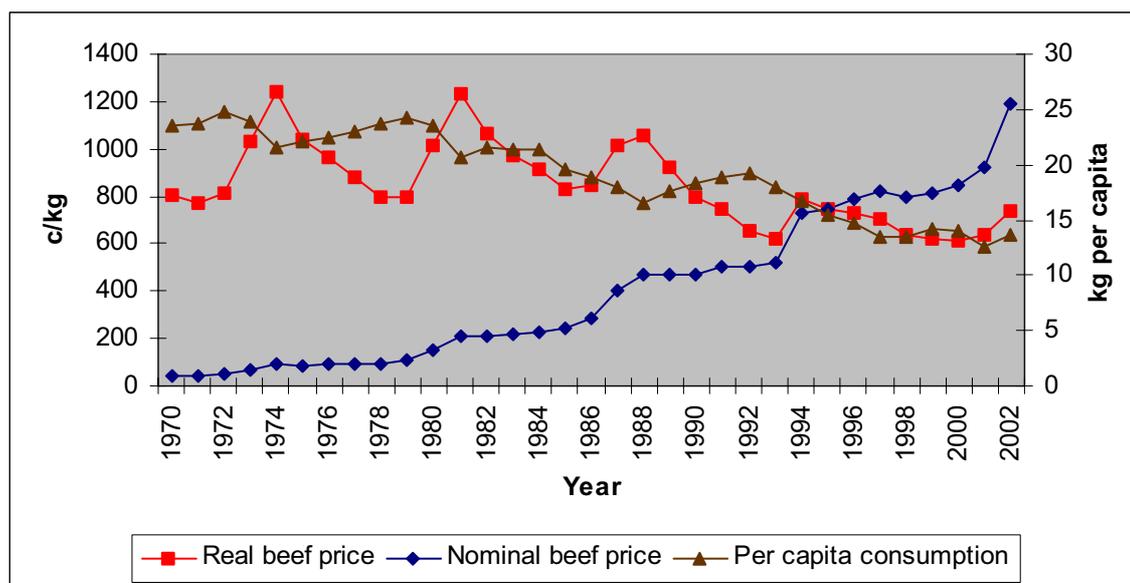
Lubbe (1990) investigated the decomposition of the components of producer price time series in the red meat industry. He states that the combined effect of rainfall, the variation in production capacity and the price expectations produce an environment for relatively unstable prices.

Figure 4.6 shows the real and nominal beef producer prices, as well as the per capita consumption of beef. It is important to note that real producer prices and per capita consumption of beef are, to a large degree, mirror images (see the previous section for other reasons for the drop in per capita consumption). This is indicative of the sensitivity of consumers to price changes of beef. Taljaard (2003) estimated compensated and uncompensated own price elasticities for beef. The compensated<sup>3</sup> own price elasticity for beef was estimated at -0.16, whilst the uncompensated<sup>4</sup> own price elasticity for beef was estimated at -0.96. Own price elasticities are interpreted as the change in the quantity demanded due to a 1% change in the price of the product, with all other factors remaining constant. In other words, in the case of the compensated own price elasticity, it would mean that a 1% increase (decrease) in price would result in a 0.16% decrease (increase) in the quantity of beef demanded, all other factors remaining constant. The interpretation of the uncompensated own price elasticity is done in the same manner. Also important to note is that it appears that the income effect in this regard is much stronger than the price effect.

Another important feature of Figure 4.6 is the real producer price cycle that ranges between 6 to 7 years (the troughs in the real prices are associated with periods of sideways moving nominal prices). It is depicted that 2002 was in all probability the end of the last price cycle, which coincided with overall increases in prices of most agricultural products. Hence, it could be expected that real prices are to decline over the next couple of years before they increase again to reach a high in 2009.

<sup>3</sup> Compensated means that the own price elasticity only accounts for the effect of price changes.

<sup>4</sup> Uncompensated means that the own price elasticity accounts for changes in both income and prices.



**Figure 4.6: Real and nominal producer prices of beef and the per capita consumption of beef (1970 - 2002)**

Source: NDA, 2003; AMT, 2003.

#### Consumer price trends

Meat retail prices generally remained stable throughout 2000. Prices began to increase during the second half of 2001. Depending on the meat product, prices peaked at different stages between September 2002 and January 2003. All the above meat prices appear to be decreasing and returning to new equilibrium levels. Maize is an important input in the production of beef under the feedlot system. It is for this reason that as maize prices continued to increase, the beef price had to follow. In 2002 and 2003, the beef price followed the fluctuation of the maize price, although not by the same extent, with a 1 to 2 month time lag. Since September 2002, the maize price has been decreasing with the beef price following this trend from November 2002 onwards. Both prices are still decreasing to date. If, however, prices are deflated using the average wage rate index, prices will remain more stable throughout the period.

#### 4.5 Producer-retail price spreads

In this section, we measure the producer-retail price spread (difference between the auction price and the retail price for different cuts of beef). The various figures that follow show the estimated wholesale and retail prices for different cuts using the block test. The block test is a measure that was developed during the time of the Meat Board for wholesalers and retailers to price different cuts given a certain producer price. Table 4.5 shows the block test factors used for different cuts. The calculation involves multiplying the producer price at a given time with the respected block test factors to get an estimated wholesale and retail price, excluding VAT and profit. In other words, the block test provides an indication of what the price of different beef products should be, excluding VAT and profits. For a more comprehensive discussion on the block test, see SAMIC (2003).

**Table 4.5: Block test factors applicable to selected cuts**

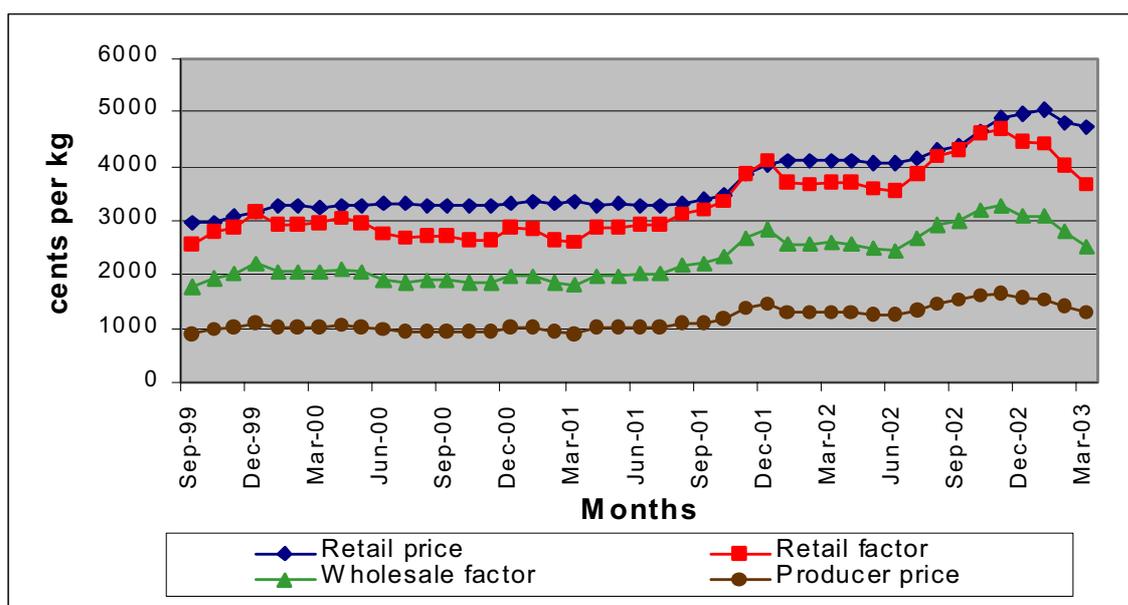
Selected beef cuts	Wholesale level	Retail level
Rump	1.97	2.84
Sirloin	1.72	2.05
Topside	1.32	2.13
Brisket	1.01	1.42
Chuck	1.10	1.49
Stewing Steak	1.29	2.13

Source: SAMIC, 2003; Botes, 2003.

The figures compare the actual average monthly price for different cuts with what the retail price should be, given the normal application of the ‘block test’.

The information depicted in Figure 4.7 can be summarised as follows:

- # The producer price and the retail price for rump tend to move in tandem.
- # The margins between the producer price and estimated wholesale price for rump are in the region of 49%.
- # Over the whole period, the differences between the producer price and the retail price range between 64 and 73%.
- # There appears to be some downward stickiness in retail prices for rump since November 2002, i.e. the producer price already started to decline in November 2002 whereas the retail price for rump only started to drop in January 2003.
- # The difference between the estimated retail price and the actual retail price of rump is very small. In fact, in some cases the estimated retail price exceeded the observed retail price for rump. The difference ranges from -2 to 23%, with an average of 11%. This difference does not account for operational costs nor does it include VAT, and, hence, it can be concluded that profits for retailers on rump are very low.

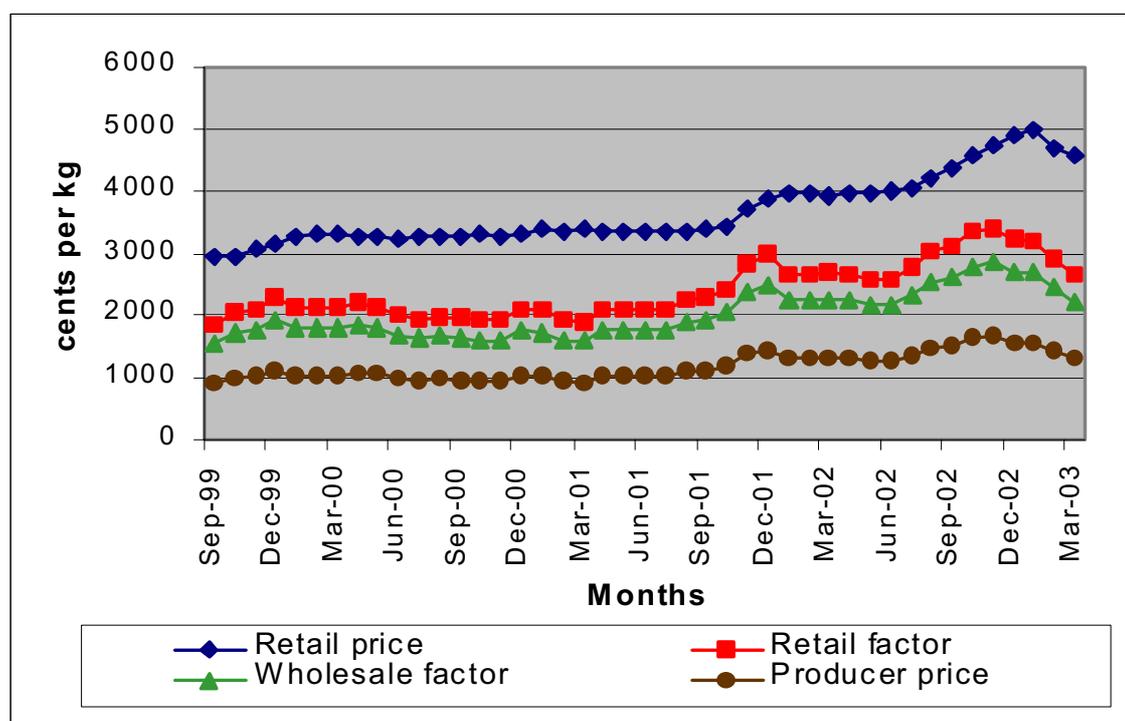


**Figure 4.7: Comparison between estimated and actual retail sales prices for rump**

Source: StatsSA, 2003; AMT, 2003; own calculations

The information depicted in Figure 4.8 can be summarised as follows:

- ⌘ The producer prices and the retail price for sirloin tend to move in tandem.
- ⌘ The margins between the producer price and wholesale price for sirloin are in the region of 42%.
- ⌘ Over the whole period, the differences between the producer price and the retail price range between 63 and 72%.
- ⌘ There appears to be some downward stickiness in retail prices for sirloin since November 2002, i.e. the producer price already started to decline in November 2002 whereas the retail price for sirloin only started to drop in January 2003.
- ⌘ The differences between the estimated retail price and the actual retail price of sirloin range from 24 to 43%, with an average of 35%. Note that operational costs and VAT are not included in the estimated retail price; hence the difference does not portray actual profit taking by retailers.



**Figure 4.8: Comparison between estimated and actual retail sales prices for sirloin**

Source: StatsSA, 2003; AMT, 2003; own calculations

The information depicted in Figure 4.9 can be summarised as follows:

- ⌘ The producer price and the retail price for topside tend to move in tandem.
- ⌘ The margins between the producer price and wholesale price for topside are in the region of 24%.
- ⌘ Over the whole period, the differences between the producer price and the retail price range between 52 and 62%.

- # The effect of downward stickiness is less evident.
- # The differences between the estimated retail price and the actual retail price of topside range from -1 to 19%, with an average of 10%. Note that operational costs and VAT are not included in the estimated retail price; hence the difference does not portray actual profit taking by retailers.

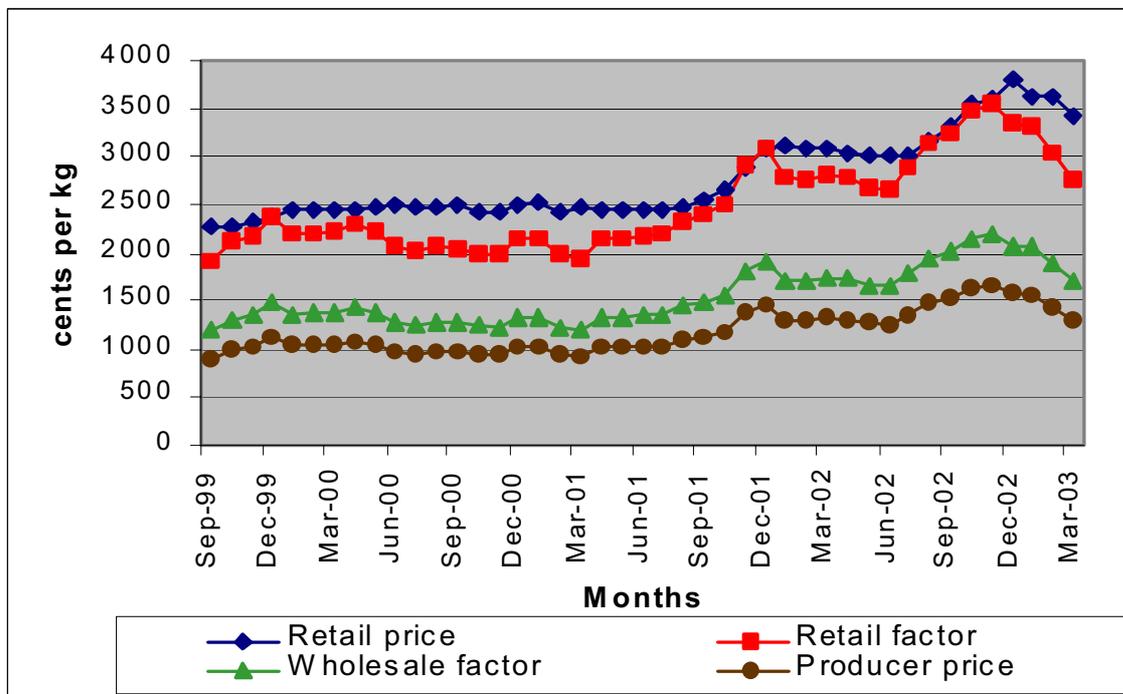
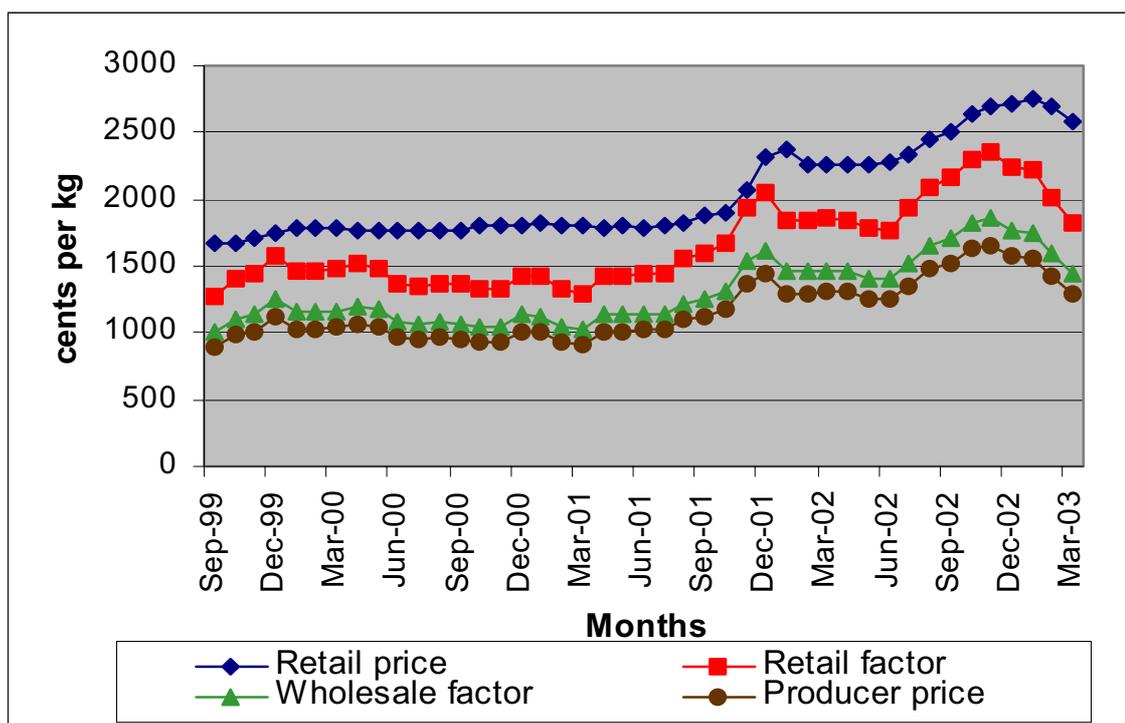


Figure 4.9: Comparison between estimated and actual retail sales prices for topside

Source: StatsSA, 2003; AMT, 2003; own calculations

The information depicted in Figure 4.10 can be summarised as follows:

- # The producer price and the retail price for brisket tend to move in tandem.
- # The margins between the producer price and wholesale price for sirloin are in the region of 11%.
- # Over the whole period, the differences between the producer price and the retail price range between 34 and 50%.
- # There appears to be some downward stickiness in retail prices for sirloin since November 2002, i.e. the producer price already started to decline in November 2002 whereas the retail price for sirloin only started to drop in January 2003.
- # The differences between the estimated retail price and the actual retail price of brisket range from 6 to 29%, with an average of 19%. Note that operational costs and VAT are not included in the estimated retail price; hence the difference does not portray actual profit taking by retailers.

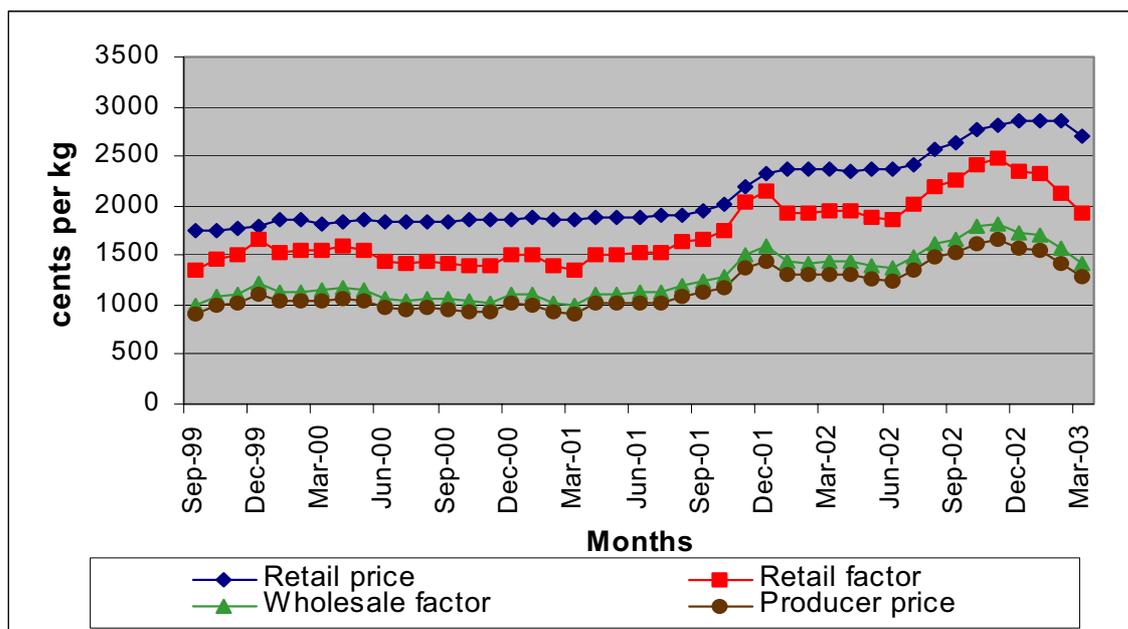


**Figure 4.10: Comparison between estimated and actual retail sales prices for brisket**

Source: StatsSA, 2003; AMT, 2003; own calculations

The information depicted in Figure 4.11 can be summarised as follows:

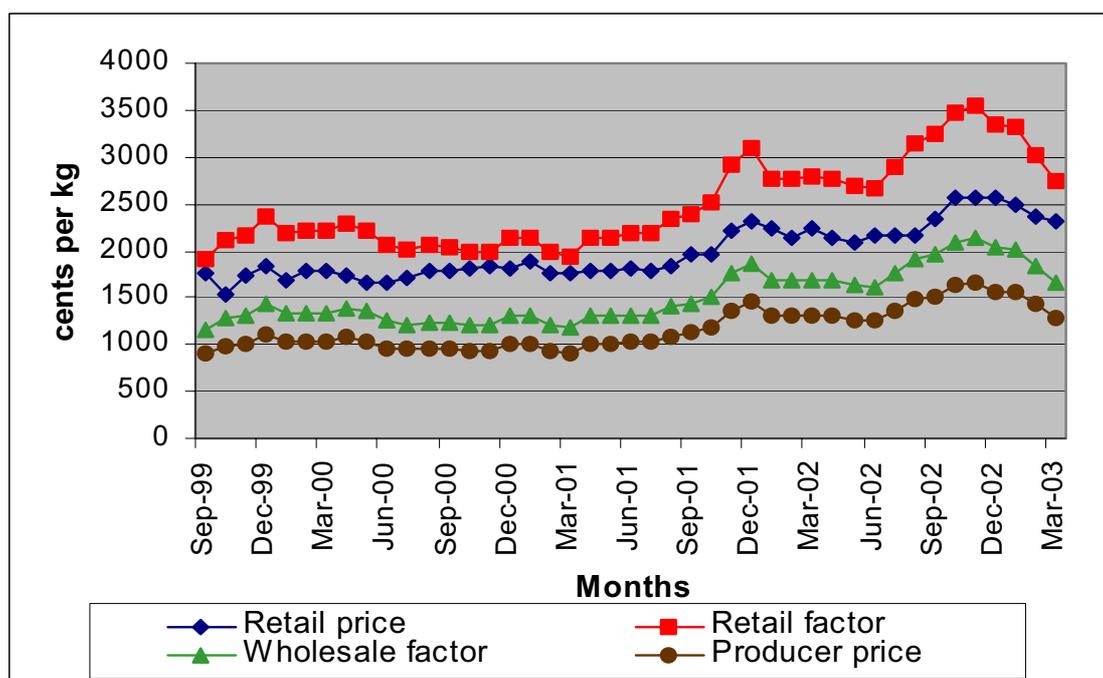
- ⌘ The producer price and the retail price for chuck tend to move in tandem.
- ⌘ The margins between the producer price and wholesale price for chuck are in the region of 9%.
- ⌘ Over the whole period, the differences between the producer price and the retail price range between 38 and 52%.
- ⌘ There appears to be some downward stickiness in retail prices for sirloin since November 2002, i.e. the producer price already started to decline in November 2002 whereas the retail price for sirloin only started to drop in February 2003.
- ⌘ The differences between the estimated retail price and the actual retail price of sirloin range from 7 to 29%, with an average of 18%. Note that operational costs and VAT are not included in the estimated retail price; hence the difference does not portray actual profit taking by retailers.



**Figure 4.11: Comparison between estimated and actual retail sales prices for chuck**  
 Source: StatsSA, 2003; AMT, 2003; own calculations

The information depicted in Figure 4.12 can be summarised as follows:

- ⊘ The producer price and the retail price for stewing steak tend to move in tandem.
- ⊘ The margins between the producer price and wholesale price for stewing steak are in the region of 22%.
- ⊘ Over the whole period the differences between the producer price and the retail price ranges between 36 and 44%.
- ⊘ There appears to be no downward stickiness in retail prices for stewing steak.
- ⊘ The differences between the estimated retail price and the actual retail price of stewing steak ranges from -8 to -45%, with an average of -25%. Note that operational costs and VAT are not included in the estimated retail price. It would appear that retailers make a loss on stewing steak in general.



**Figure 4.12: Comparison between estimated and actual retail sales prices for stewing steak**

Source: StatsSA, 2003; AMT, 2003; own calculation.

#### 4.6 Costing and pricing by feedlots

Supply and demand forces generally determine the purchase prices of weaners. Feedlots can purchase weaners on auctions or at the farm gate. With respect to "farm gate purchasing", feedlots source weaners directly from the producers on their farms. This is either done by farmers offering their animals to a particular feedlot or by the representatives of the feedlot approaching the farmer. In other words, producers and farmers will "shop around" for prices to realise the best price. It should also be noted that feedlots are prepared to pay for quality. This entails that farmers producing the right type of animal will receive a premium from the feedlot. It is also known that feedlots are willing to buy animals from producers further away if they produce the required quality. The track record of a producer also influences the price a feedlot is willing to offer.

Carcasses and the fifth quarter<sup>5</sup> are sold by feedlots to wholesalers and retailers according to supply and demand conditions. An industry source stated that there is no such thing as "loyalty" in this industry. Wholesalers and retailers will buy where price and the associated quality is the best. Feed procurement takes place on the same basis.

A general characteristic of the industry is negative buying margins and positive feeding margins. The concept of a negative buying margin can be explained by the following example: Suppose a feedlot purchases a weaner of 200kg at a price of R9 per kg in 2002. At a dressing percentage<sup>6</sup> of 48%, it would mean that the feedlot is actually paying R18.75 per kilogram carcass whilst the market price per kilogram carcass ranges between R13 and R16.60 (average of R14.11/kg). Hence, there would be a negative buying margin of on average R4.64/kg.

<sup>5</sup> Hides and offal

<sup>6</sup> This percentage refers to weight of the carcass after the animal has been slaughtered, i.e. an animal with a weight of 230kg will have a carcass weight of 110 kilogram (Ford, 2003).

A positive feeding margin refers to the fact that the value per kilogram carcass weight gained is higher than the cost of feeding the animal to gain a kilogram of carcass weight. Note: feedlots aim to double the carcass weight of an animal. In other words, if a typical feedlot feed ration costs R0.80 per kilogram and an animal eats 9 kilogram to gain 1.5 kilogram in live weight per day the feed cost amounts to R7.20 per day. Added to this are the overhead costs of R1.50 a day, which brings feeding cost per day to R8.70. In order to get the feeding cost per kilogram per day, R8.70 is divided by 1.5. This gives a feeding cost of R5.80 per kilogram live weight gained per day. In order to get the feeding cost per day per kilogram carcass weight gained, the latter is divided by 0.65. Hence, the result is a feeding cost of R8.92 to produce 1 kilogram of carcass weight. In 2002, the average cost of a feed ration amounted to R1.17 per kilogram (Ford, 2003). Thus, by following the procedure mentioned, the feeding cost to get a kilogram of carcass weight is R12.34. This translates into a positive feeding margin of R1.77 per kilogram.

In respect of the 2002 season two important issues must be noted from the above:

- ⌘ Given a negative buying margin of R4.64 per kilogram and a positive feeding margin of R1.77 per kilogram, feedlots made a loss of R2.87 per kilogram carcass weight. Taking a carcass of 200 kilogram, this loss would then translate into R574. (Note that the figures reported may deviate from feedlot to feedlot, but on average losses between R200 and R600 per carcass were mentioned).
- ⌘ If the feedlot industry were in a position to manipulate prices, they would not have taken such large losses. In other words, it can be concluded that, although this industry is characterized by a high degree of concentration, it is not able to affect the market in any meaningful way.

As is clear from the above, the viability of feeding cattle is based on the beef : grain price ratio. Since grain prices are relatively high in South Africa, the feedlot industry has been relegated to the use of grain by-products. In this respect, it is important to note that the main feed source in the feedlot industry is hominy chop. In 2002, the hominy chop prices were, on average, 98% of the maize price, which is much higher than the usual ratio of 82%. The question raised in the feedlot industry is to what extent hominy chop prices have subsidized the maize meal prices during 2002.

Cognisance should also be taken of the fact that the South African feedlot industry is the only feedlot industry in the world that does not have a final carcass realisation price before the feeder calf is purchased, i.e. feedlot owners do not know the price for which they will be able to sell the carcass at the time they purchase the weaner. This contributes to the feedlot industry being a high-risk industry.

#### *Pricing at abattoir level*

The payment for slaughtering of animals by producers, feedlots and wholesalers normally takes three forms, namely (i) the abattoir retains the offal and the hide, (ii) they only retain the offal or (iii) a slaughter fee is negotiated. Hides and skins are sold to tanneries whereas offal enters the so-called 'black market' or informal market that reaches its peak in the winter and slows down in the summer months<sup>7</sup>.

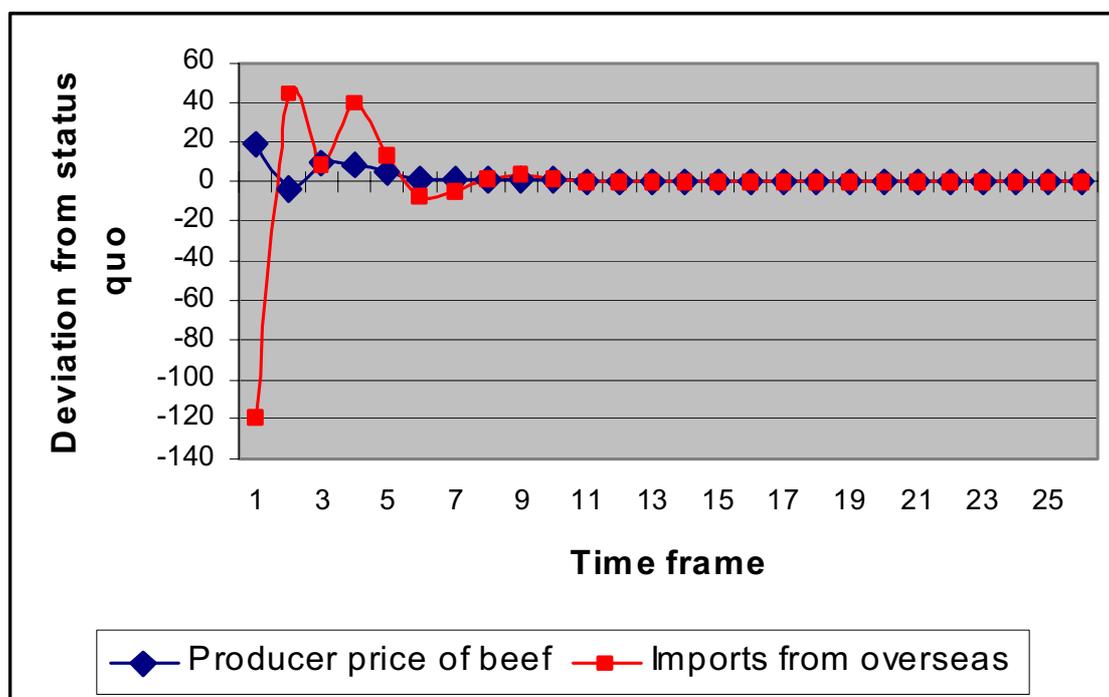
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<sup>7</sup> The majority of offal consumers do not have facilities for storing offal for longer than one day in summer, whereas during the winter they can keep offal for as long as three days. Hence, consumers tend to purchase smaller quantities during summer. Furthermore, it is also known that slaughtering of livestock increases

Cognisance should be taken of the fact that between 70 and 80% of cattle slaughtered come from the feedlot industry. Hence, the contact between abattoirs and beef producers is much less than previously, which underpins the notion that carcass auctions have lost their prominence in the South African red meat industry.

#### 4.7 The effect of exchange rate shocks on beef prices and imports

A trivariate Vector Autoregressive Model (VAR) was estimated to determine the effect on real producer prices and beef imports from overseas in relation to the effect of unit shocks (equal to one standard error) on the exchange rate. This analysis is underpinned by tests for statistical properties of variables, decisions on lag length and tests for contemporaneous correlation of shocks. Contemporaneous correlation of shocks in the VAR was tested using the log-likelihood ratio statistic. The impact of an exchange rate shock on real producer prices of beef and beef imports from overseas is shown in Figure 4.13. In respect of producer prices, a shock in the exchange rate will influence producer prices for at least 5 months after such a shock has occurred. The effect on imports from overseas is more severe and carries for at least 10 months.



**Figure 4.13: The effect of exchange rate shocks on producer prices and imports over a period of 25 months**

A test for cointegration using Johansen's (1988, 1991) maximum likelihood approach based on maxim and trace eigenvalue statistics was also done. It was found that one cointegration relation exists between the mentioned variables (i.e.  $r=1$ ). In other words, a long run relation does exist between the exchange rate, producer prices for beef and imports from overseas. The implication of this is that significant shocks in the exchange rate will affect producer prices and imports over the long run. Moreover, high volatility in the exchange rate will also be reflected in beef prices and imports. Figure 4.14 shows

especially the festive season, resulting in an oversupply of offal. Hence, the peak season refers to good demand and prices during the winter months.

the level of volatility in the exchange rate. The methodology used is similar to that used for beef prices and imports. Note the level of volatility since the end of 2001 and how it corresponds to the volatility in beef prices and total imports over the same period.

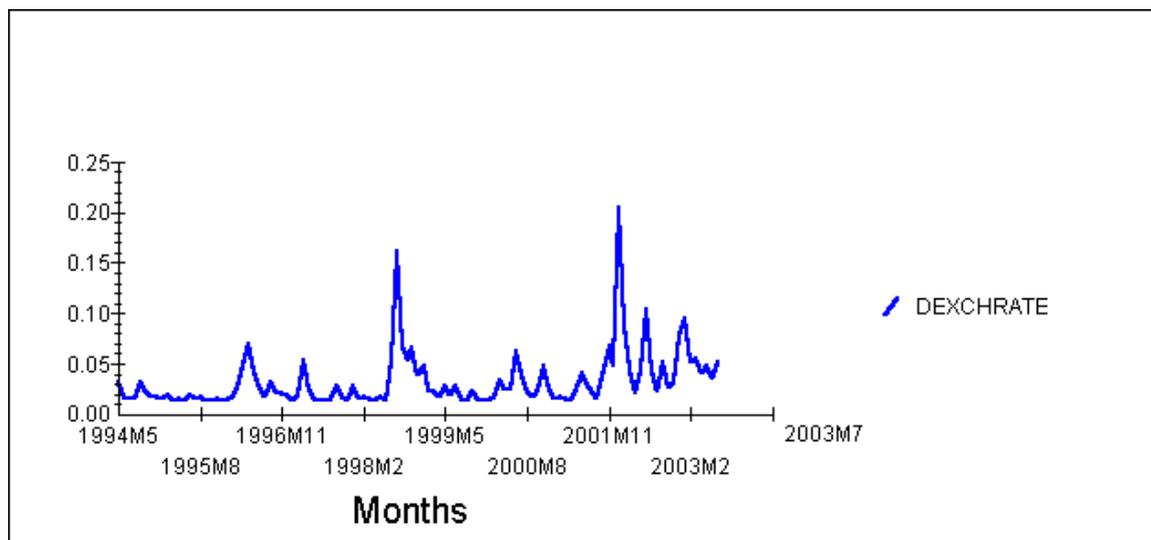


Figure 4.14: Conditional standard deviation of the exchange rate (1994 – 2003)

#### 4.8 Conclusions

It appears that price volatility has increased substantially since the latter part of 1999. The volatility in prices since 2001 is largely a result of the exchange rate volatility from 2001 onwards.

The real producer price cycle ranges between 6 to 7 years. In this regard, 2002 was in all probability the end of the last price cycle, i.e. real producer prices reached a cyclical high and it can be expected that real prices will decline over the next couple of years before they increase to reach another high in 2009. This cyclical high coincided with overall increases in prices of most agricultural products in 2002.

There is a large degree of concentration in the feedlot industry, but due to issues related to economies of scale and the biological nature of the production system, it is extremely difficult to manipulate market prices for beef. This is underpinned by the fact that in most cases feedlots experienced large losses in 2002, i.e. they were not able to cascade input cost pressures down to downstream role players.

**The producer-retail price spread:** A comparison was made between producer prices and retail prices for the following cuts: rump, sirloin, topside, brisket, chuck and stewing beef. The analysis used the block test to estimate wholesale and retail prices, which were then compared with actual retail prices. The producer price and the retail price for all cuts tend to move in tandem. There was downward stickiness in retail prices over December 2002 and January 2003, except for stewing beef.

The margin between the estimated retail price and the actual retail price for the mentioned cuts were on average:

### *Analysis of selected food value chains*

Rump	11%
Sirloin	35%
Topside	10%
Brisket	19%
Chuck	18%
Stewing beef	25%

Note that operational costs and VAT are not included in the estimated retail price. It can, therefore, be concluded that profits margins at retail level for most of the mentioned cuts are very thin. In fact, it appears that retailers make an outright loss on stewing beef.

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