Farm-to-retail-price-spread definitions and Methodology

The formulas behind this data series consists of four parts (Food Price Monitoring Committee report, 2003):

- **The farm value** is the value of the farm product's equivalent in the final food product purchased by the consumers.
- **The retail value** is the price or the value of a given product at the retail level of a given commodity value chain.
- **The farm-to-retail-price-spread (FTRPS)** is then calculated by the difference between the retail value and the farm value.
- **The farm value share** is then calculated by the growth between the retail value and the farm value.

a) Wheat-to-bread margins (white and brown)

The different prices in the four main levels in the value chain are: the average producer price that the farmer receives as reported by South African Future Exchange (SAFEX); the mill door price; the bakers' wholesale price; and the consumer price. However, in this exercise only the average producer price and the consumer price will be utilised. The calculations are based on the following assumptions:

- The producer price (also known as the farm gate price) is derived from the SAFEX spot price minus the average transport differential and the handling costs.
- The transport costs from the farm gate to the silo are calculated as the average SAFEX transport differential to all the major maize silos.
- The handling costs are based on responses from millers about their estimated average handling costs and the storage day tariffs per ton. The input from the millers is therefore crucial in this case.
- It is assumed that the millers are closer to the silos than the farmers.
- There is an approximate four-month time lag between the monthly average SAFEX spot price and the average monthly retail price.
- The cost of bread flour between the milling and baking divisions can be neglected, as this is an internal transfer within the group and not determined by market forces. Thus, to determine the cost of production of bread there is no separate margin for the milling and baking divisions.
- The extraction rates between brown and white bread differ. The extraction rate from 1 ton of wheat is 0.87 tons of brown bread flour and 0.8 tons of white bread flour. Assuming that 447 grams of flour per standard 700g loaf is used, 2 095 brown loaves can be baked per ton of flour. Similarly, if 509 grams of flour per standard 700g loaf is used, 1 966 white loaves can be baked per ton of flour.

Farm value is calculated by dividing the farm gate price by the respective extraction rates namely, 0.8 for white bread and 0.87 for brown bread respectively.

Retail value is calculated by multiplying the price of white and brown bread by the number of loaves that 1 ton of flour produces, i.e. 2 095 for brown bread and 1 996 for white bread, respectively.

The farm value share is the proportion farmers receive from the amount consumers spend on the basket of food purchased in retail grocery stores. This is equal to farm value divided by the retail value.

The producer price of wheat is therefore calculated by taking the SAFEX price, subtracting the farmers' transport cost to the silo, as well as the handling and storage costs.

b) Maize-to-maize-meal margins (super and special)

The prices of the four main nodes in the maize chain are: the average producer price; the mill door price; the list price; and the consumer price. In this case, only the average producer prices and retail prices will 3 be utilised to estimate the farm value, farm-to-retail-price-spread, retail value and farm value share. The calculations of these items are based on the assumptions that:

- The producer price (also known as the farm gate price) is derived from the SAFEX spot price minus the average transport differential and the handling costs. The transport costs from the farm gate to the silo are calculated as the average SAFEX transport differential to all the major maize silos. The transport differential has changed since roads have become a major participant to be included into the calculation of the differential. The adjustment based on ratio/percentage of rails and roads have been used to calculate the location differentials. The handling costs are based on responses from millers about the estimated average handling costs and the storage day tariffs, per ton. The input from the millers is therefore crucial in this case.
- It is assumed that the millers are located closer to the silos than the farmers.
- There is an approximate four-month time lag between the average monthly SAFEX spot price and the average monthly retail price.
- Specific mill site costs are only available on an annual basis. Therefore, the monthly mill site costs are kept constant for a one-year cycle.

Table 1 below provides a summary of the extraction rates of the various types of maize meal, as sourced from the National Chamber of Milling (NCM). It is essential to make a distinction between the various types of maize meal due to their different extraction rates, which influence the margins and spread of the millers significantly. More than 40% of all the maize meal sold in the South African market is super maize meal, and this percentage is increasing. Special maize meal sales contribute 30% of total maize meal sales. Although an extraction rate of 62.5% is reported for super maize meal, some industry specialists regard this value as “conservative”. The best-selling super maize meal brands, IWISA and ACE, only have a 55% extraction rate.

Table 1: Extraction rate of various maize meal types

Type	Extraction rate
Super	62.5%
Special	78.7%
Sifted	88.7%
Unsifted	98.7%

The farm value for one-ton super maize meal is calculated by dividing the farm gate price by the average extraction rate (62.5% for super maize meal). This implies that one ton of super maize meal can be produced from 1.6 tons of raw white maize.

The retail value for one-ton of super maize meal is calculated by multiplying the retail price (R/specific size) by 1 000/that specific size. For example, conversion for 5kg bag of maize meal (R20/bag) is calculated by multiplying 20 by 1 000/5 = (200). This is equal to R4 000/ton.

Farm-to-retail-price-spread is the difference between farm value and retail value (farm value minus retail value).

The farm value share is the proportion farmers get from the amount consumers spend on the market basket of food purchased in retail grocery stores. This is equal to farm value divided by retail value.

c) Beef margins

The first assumption relates to the average slaughtering weight of one head of cattle, which is equivalent to 220kg. Of the 220kg: 42.24kg consist of parts, which do not form part of any direct food related items, and include off-cuts, fat, kidneys and bones. The second assumption relates to the allocation of certain weights to different meat cuts out from a 220kg carcass. Rump steaks are allocated a weight of 2.47%, T- bone 3.64%; mince 11.36%, stew 31.82%, chuck 18.02%, sirloin 2.15%, fillet 1.15% and brisket 7.54%. Stats SA included additional cut prices from January 2017, including stew and offal, of which stew will be included in calculating the spread between farm and retail levels.

The farm value of beef is therefore calculated by firstly determining the average weight of the specific cut in question. This would mean that from a 220kg carcass weight, +/-78.2% is made up by cuts specified above. To calculate the farm value, the weight of the cut is multiplied by the weighted average monthly slaughter price of A2/A3 quality beef (per kg). **The retail value** of a selected cut is then calculated by multiplying its price (R/kg) by its weight. The total retail value of these eight cuts combined is then obtained by summing up the specific retail values.

Farm-to-retail-price-spread is the difference between farm value and retail value (farm value minus retail value).

The farm value share is the proportion farmers receive from the amount consumers spend on the market basket of food purchased in retail grocery stores. This is equal to farm value divide by the retail value.

d) Lamb margins

The average slaughtering weight of a lamb carcass is equivalent to 20kg. Parts include off-cuts, fat, kidneys and bones, which do not form part of any direct food related items. The second assumption relates to the allocation of certain weights to the different meat cuts from a 20kg carcass. These include: leg 25.6%, loin and saddle chops 29.9%, neck 3.4%, rib chops 9.5% and stew 18.2%.

The farm value of lamb is therefore calculated by firstly determining the average weight of the specific cut in question. To calculate the farm value, the weight of the cut is multiplied by the weighted average monthly slaughter price of A2/A3 quality lamb (per kg). **The retail value** of a selected cut is then calculated by multiplying its price (R/kg) by its weight. The total retail value of these five cuts combined is then obtained by summing up the specific retail values.

Farm-to-retail-price-spread is the difference between farm value and retail value (farm value minus retail value).

The farm value share is the proportion farmers receive from the amount consumers spend on the market basket of food purchased in retail grocery stores. This is equal to farm value divided by retail value.