Introduction to the General Principles of Agro-Processing:
Faced with the current economic realities, farmers worldwide are searching for new options of surviving, as well as expanding their business. One of the many opportunities to grow markets, turnover and profits, is by adding value to farm produce through further processing. Most value-added food products available to consumers have been processed in some way or other, even if the processing is as simple as cleaning produce before it is packed in plastic- or net bags. Two types of processing methods may be performed on raw materials:

- Primary Processing: this type of processing includes the simplest of processes such as washing, peeling, chopping, ageing, the milling of wheat for flour production, and the processing of sugarcane;
- Secondary Processing: this type of processing involves the conversion of primary processed products into more complex food products and includes procedures such as mixing, depositing, layering, extruding, drying, fortifying, fermentation, pasteurisation, clarification, heating etc.

Agro-Processing of Field Crops:
In the food processing industry, peppers are divided into two basic categories, namely hot (spicy/pungent) varieties and the sweet (mild) varieties. Hot peppers include cayenne peppers, chillies, hot banana peppers and Jalapenos while the sweet peppers include the bell peppers, paprika, pimento, sweet banana peppers and sweet cherry peppers.

In South Africa only about 10 % of the tomato crop is processed, of which 85 % is destined for the tomato sauce market and 10 % for frozen tomato products. In contradiction to these figures, the USA processes 50 % of its tomato crop while Europe is currently processing 30 % of its tomato crop. Seen in the light of South Africa’s annual import of about 1300 tons of tomatoes, the question arises whether this is not perhaps an under-utilised opportunity for South African producers and processors in the tomato industry.

- Pepper Products:
  - Canned red or green chilli peppers have a storage life of several months and are used as a convenience product when the fresh product is out of season. Chillies are usually canned without packaging liquor.
  - Dehydrated chilli peppers: Chillies are hot, pungent peppers that can be preserved by dehydration. Although sun drying is also possible, artificial drying or dehydration will be discussed in this report. The mature chilli pods are dehydrated to final moisture content of 3 % for safe long-term storage. The dried pods may also be ground into powder to produce red pepper (Cayenne pepper).
  - Frozen bell pepper pieces: Bell peppers are one of the few vegetables that can be frozen without blanching. Bell peppers are frozen in sliced or diced form and will keep for about nine months to a year.
  - Pepper salsa: Bell peppers can be preserved in the form of a sauce known as Salsa. Salsa is a spicy sauce that is served with meat and Mexican food. It is best served fresh, but can be frozen for later use. Peppers are chopped with tomatoes, onions, garlic and spices such as fresh parsley, basil or oregano.
  - Pickled bell peppers: Peppers can easily be pickled in a brine or vinegar solution, alone or with other vegetables and seasoning. The variety of coloured peppers available make attractive pickles. Certain varieties can be pickled as whole pods, while larger peppers are cut into strips.

- Tomato Products:
  - Canned tomatoes: Tomatoes can be canned whole or sliced or chopped for the canning of stewed tomatoes. Desirable characteristics of a processing tomato includes an intense, uniform red skin and pulp colour, a high total solids content with a good flavour and firm, meaty texture. A round shaped tomato with smooth skin is preferred since cracks and cavities complicate washing and peeling. If mechanical harvesting practices are used, it is further required that the tomato cultivar yields a uniformly ripened crop to minimise losses.
  - Sun-dried tomatoes are produced by drying ripe tomato slices under shade cloth, out of direct sunlight. Tomatoes are dried in the form of halves, quarters or slices. The final product has a brown colour, distorted shape and does
Tomato jam is produced from green or ripe tomatoes. Jam is a product which consists of whole fruit, pieces of fruit, fruit pulp or fruit puree of one or more types of fruit with fruit juice or concentrated fruit juice as an optional ingredient, and may contain permitted food additives and sweeteners.

Tomato juice: Tomato juice is the un-concentrated, strained liquid extracted from ripe tomatoes. It is thus free of skin, seed and coarse particles, but contains insoluble solids in suspension. It may or may not be seasoned with salt. Tomato juice has a bright red colour and is opaque with a typical cooked tomato taste. It is high in nutrients, especially vitamin A.

Tomato leathers (fruit rolls): Fruit leathers are dried sheets of fruit pulp with a soft rubbery texture and sweet taste, characteristic of the fruit used. Most types of fruit can be used to produce fruit leathers, either alone or in mixtures. The most commonly used fruits are apples, various berries, tomatoes, apricots, peaches, plums, mangoes, guavas, pineapples and granadillas. Layers of different coloured leathers can be pressed together to form a sandwich. The single layers can be cut in various shapes or strips that can be rolled up.

Tomato paste is a concentrated tomato pulp product in which the tomato solids have been increased to 24 - 30 %. Higher concentrations are also available. The term "tomato puree" is also used for tomato concentrates produced by the evaporation of strained tomatoes but is generally less concentrated (>8.5 % total solids) than tomato paste.

Canned Tomato Soup: In the place of the individual whole spices and seasonings used in the soup, a custom blend of seasoning mix produced from spice, essential oils and oleoresins may be used, but a spice firm of a seasonings manufacturer must be consulted for the correct formulation.

Condensed Tomato Soup: In the place of the individual whole spices and seasonings used in the soup, a custom blend of seasoning mix produced from spice, essential oils and oleoresins may be used, but a spice firm of a seasonings manufacturer must be consulted for the correct formulation. Condensed soups are pack in No.1 cans, with the preparation directions stating that one can of water must be mixed with the soup, after which the mixture is heated and then served.

Further Processing Options:
The products discussed above are only a small sample of the many processing methods and products available to the grower and processor. Other options range from products such as fresh cut bell peppers and small-scale pickling of chilli peppers to tomato chutney and tomato powder.