

## Agricultural processing brochure

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### Processed meat groups:

- **Whole** meat products
- **Minced** meat products
- **Emulsified** meat products

### Yield:

12 %  
weight gain  
can be expected  
during curing, i.e.  
0.94 kg  
of raw tongue  
will yield  
approximately  
1 kg  
of tongue  
before cooking.

South African farmers facing current economic realities are searching for new options to maintain or expand their businesses. One of the many opportunities to grow markets, turnover and profits is by adding value to farm produce. Options need to be selected carefully based on sound information and knowledge of the opportunities presenting themselves, taking into account the strengths and weaknesses of individual farms.

## Introduction

### Product group: Meat products

The deregulation of the meat industry has provided opportunities for livestock farmers to slaughter, process and market their own animals. Abattoirs on farms are quite common these days.

Alternatively, approved meat can be brought in for processing. Meat is a very versatile food substance, with a wide variety of processed product possibilities.

Processed meat products are classified into three broad groups, based on the size of the meat particle used:

#### **Whole meat product**

- muscle tissue is still clearly recognisable and defined in the end product (e.g. ham, bacon, pressed pork or beef);

#### **Minced meat products**

- meat structure has undergone a degree of breaking up for

example in a mincer and the meat is no longer in a fibre form, but particle form (e.g. salami, fresh sausage, hamburger patties, meat balls etc.); and

#### **Emulsified meat products**

The muscle tissues have been finely minced and are not recognisable any more in the fibrous or particle form (e.g. frankfurters, viennas, polonies and meatloaves).

## Product description: Cooked pickled tongue

Cooked pickled tongue is categorised as an edible meat by-product. It is neatly trimmed tongue that is free of bone, epiglottis, external fat and glands.

All types of tongues can be pickled, including beef, lamb, sheep and pig. Beef tongue is the most popular choice in South Africa.

(Also see report on "Canned tongue").

## Process description: Cooked pickled tongue

### Washing of tongues

The tongue is carefully washed in potable water after separation from the carcass. Cold running water removes excess blood and mucus while it cools the tongue. The washed tongue is immediately placed under cold storage and chilled to below 4°C.

### Trimming of tongues

Trimming is the deliberate removal of unwanted or unfit parts of a food product. The tongue is trimmed manually using a sharp knife to remove damaged parts and to neaten the ends at the root of the tongue. Tongues containing

bruises or lacerations, as well as excessively trimmed tongues, are not suitable for sale as whole, cured tongues.

### Removal of mucus from tongues

Hog tongues are covered with a mucus layer that must be removed by scalding. Scalding involves washing the tongue in hot water in special types of washers. Scalding should, however, be performed very carefully, ensuring that the water is not too hot, to prevent cooking of the surface. This will result in unsatisfactory absorption of

curing agents and thus hamper colour development during curing.

Beef tongues are not scalded, but soaked overnight in a strong salt solution to loosen all the mucus for easy removal.

### Preparation of brine for meat

Dry salt mixtures can be obtained commercially and requires minimum preparation before use. As an alternative, brine can be prepared by selecting, weighing and mixing specific ingredients such as those listed below:

| Ingredient               | Purpose / Action   |
|--------------------------|--|
| <b>Salt</b>              | Improves taste, acts as preservative, enhances solubility of meat proteins * |
| <b>Nitrate/Nitrite</b>   | Colour development, taste development, preservative**                        |
| <b>Polyphosphate</b>     | Water binding, buffer systems **,*   |
| <b>Sugars</b>            | Balance saltiness, colour stabiliser *                                       |
| <b>Citrates</b>          | Water binding, buffer system **  |
| <b>Non-meat proteins</b> | Water binding, texture improvement *,**                                      |
| <b>Gums</b>              | Water binding **   |
| <b>Sodium ascorbate</b>  | Colour fixing **   |
| <b>Flavourings</b>       | Taste improvement **   |
| <b>Starches</b>          | Water binding **   |

\* Requirements of the South African Standard specification must be adhered to.

\*\* Requirements of the regulations published under Act 54 of 1972 must be adhered to.

There are a few general rules that should be kept in mind when preparing your own brine:

1. The water temperature must not exceed 10 °C.
2. A high-speed mixer is the most effective way to dissolve brine components.
3. The phosphate must always be added before the salt. If the salt is added first, the phosphate will not dissolve.
4. If soy isolate is used as a non-meat protein, it must be hydrated with water before any other brine component is added. If salt is added before the protein, it may lead to incomplete protein hydration.
5. After all the above rules have been complied with, the other components may be added in any sequence.

### Dry curing:

Dry salt as curing agent is soluble in natural moisture present in meat and penetration is a result of diffusion

1 – 1½  
days per kg  
product at

2 – 4°C

### Injection curing:

Pumping the meat with approximately

12 – 14 %  
brine,  
followed by a

2 – 3

day immersion  
in brine, without  
nitrate

### Pickling (curing) of tongue

Pickling involves the application of salts, together with colour fixing ingredients and seasoning to meat to attain unique properties. These properties include colour, stabilization and flavour modification, textural changes and a reduction of shrinkage during processing.

Several methods of curing meat are in practice. Traditionally, meat was preserved by covering it in heaps of dry salt (the so-called dry cure method). The curing agents are soluble in the moisture naturally present in the meat and penetration is as a result of diffusion (1 – 1½ days per kg product at 2 - 4°C). This method is rarely used today since it involves long periods of curing, drying and maturing.

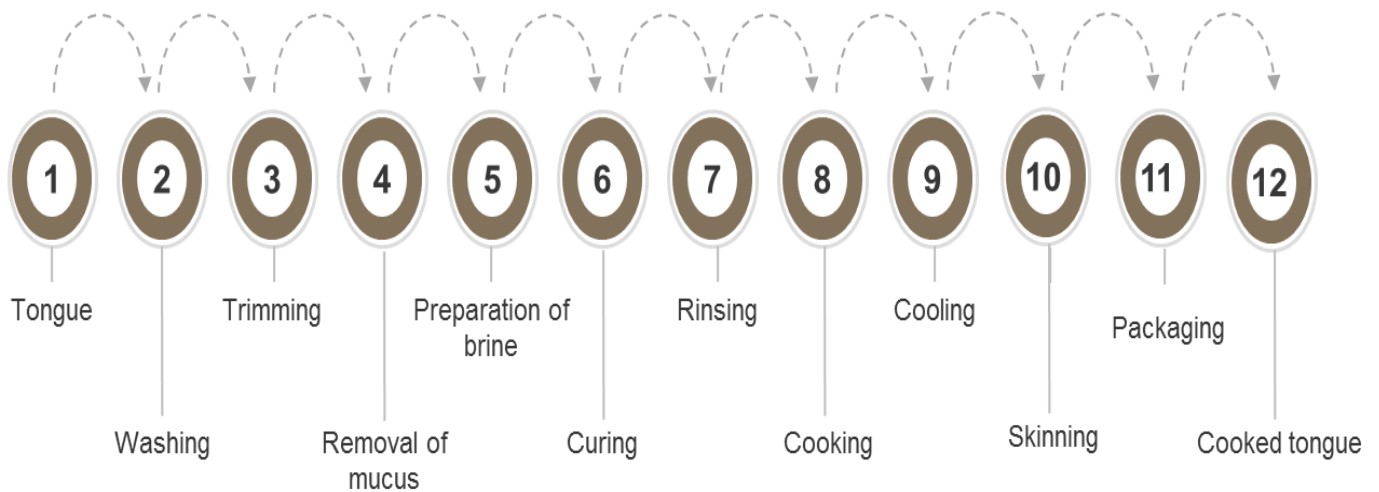
The first major departure from the traditional dry cure method was the introduction of a solution of curing salts, called a *brine* or *pickle*, in which the meat was immersed (*tank curing* or *Wiltshire curing*). This method of soaking whole meat cuts in brine solutions overnight greatly speeds up the curing process while reducing the quantities of salt required.

The traditional Wiltshire cure has greatly been replaced by the *sweetcure*, which produces a blander flavour due to a lower salt content and added sugar. The curing process is even further shortened by injecting (*pumping*) the brine into the meat.

Beef tongues are usually pumped before immersion in a suitable pickle (tank curing method). This shortens the curing process. Injection curing involves pumping the meat with approximately 12 - 14% brine, followed by a 2 - 3 day immersion in brine without added nitrate. Injection can be done with either a single needle (small-scale production) or multi-needle mechanical injectors (large scale). Injectors utilise a process called stitching whereby the brine is injected through a hollow needle as used for larger tongues. Stitching ensures a more uniform colour development in larger tongues.

Lamb, sheep and pork tongues are usually not pumped but cured by rubbing with salt before a 4 - 14 day immersion (tank curing) at 4.4°C.

## Process overview



### Rinsing of pickled tongues

The pickled tongues are rinsed under cold water showers to remove excess curing salts or solutions. The tongues are then left to dry naturally or dried with disposable wipes.

It is important to use only potable water for the rinsing process. Potable water is defined as water free of suspended matter and of substances that could be deleterious to the products or harmful to health.

In addition, the water shall have been so treated, by flocculation, filtration, chlorination or other acceptable process, as to ensure compliance with the following microbiological requirements:

- Total count shall not exceed 100 per ml,
- Coliform organisms shall not exceed five organisms per 100ml, and
- Faecal coliform shall not be detectable in 100ml of water

### Cooking of tongues

Cooking takes place immediately after pickling. The tongues are

simmered at 100°C for 2½ - 3½ hours, depending on the type and size of tongue.

### Cooling and skinning of tongue

The cooked tongue is removed from the cooker and cooled as quickly as possible using cold potable water. The running water also removes any

residual fat from the tongue. The skin of the cooled tongue is removed along with the hyoid bone (if present).

### Slicing of tongue (optional)

Cooked tongues can be sliced for consumer convenience. The slices

should have a uniform thickness of less than 10mm.



### Packaging of cooked tongue

Packaging is defined as the containment of a food product in a protective barrier that

prepares goods for transport, distribution, storage, retailing and end-use.

Cooked tongues, especially sliced, are vacuum-packaged for direct sales.



### Labelling of meat products

The products are labelled/printed with the necessary information. Labelling in South Africa is controlled by legislation.

Anyone who wants to use the information provided in this document must familiarise him/herself with all the applicable laws that apply to the producing,

processing, manufacturing and storage of the products referred to in this document.



### Other process option: Edible meat by-products

Below is an alphabetic list of other processing options in this category not covered in this report, but available from Eskom.

**Blood processing** produces three major products, namely *whole blood meal*, *plasma* and *red blood cells*

**Liver spread** is an emulsified product stuffed in a plastic or natural casing and has a texture similar to paté.

**Blood meal** is produced from blood that is hygienically recovered during the slaughtering process. The blood is dried in various ways.

**Canned tongue** is tongue that has been pickled and then heat processed in cans.

**Pickled tongue** is a neatly trimmed beef, lamb or pork tongue that is free of bone, epiglottis, external fat, glands and skin that has been cured.



### Energy Advisory Services

Eskom's role is to aid the client with basic information in the decision-making process. Thereafter the Eskom Advisor will fulfil the role of energy advisor as part of the team that the farmer selects.

#### Optimise your energy use

Eskom's Energy Advisors, in regions across South Africa, offer advice to business customers on how to optimise their energy use by:

- Understanding their energy needs
- Understanding their electrical systems and processes

- Investigating the latest technology and process developments, including electric infrared heating and drying systems
- Analysing how to reduce energy investment costs
- Optimising energy use patterns in order to grow businesses and industries

**Call 08600 37566**, leave your name and number and request that an Energy Advisor in your region contacts you.

Alternatively, e-mail an enquiry to [advisoryservice@eskom.co.za](mailto:advisoryservice@eskom.co.za).

## Alternative funding:

Five alternative funding product offerings are available to help reduce your investment costs for new agro-processing or agro-beneficiation businesses or to expand/improve an existing agro-processing or agro-Beneficiation business.

- For more info visit:

<http://www.eskom.co.za/sites/idm/Business/Pages/Alternativefunding.aspx>

## Literature sources

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