



# Troubleshooting in Fresh Products



It sometimes happens that fresh products such as boerewors, wors etc. take on an unpleasant dark colour soon after manufacture. To prevent this occurring in your products, ensure that you adhere to the following tips:

1. Keep to the recommended recipe as the levels of preservatives have been accurately determined for the final product by our Research and Development Laboratory.
2. Always thoroughly rinse buckets and containers used to decant tapwater, as they may be contaminated with nitrate dust.
3. Always ensure equipment used for the manufacture of fresh products is located well away from the cured/processed products line. This is because curing salts contain nitrate which easily dusts. This will settle on equipment and product, causing contamination. For this reason it is always advisable to wash equipment properly and to additionally rinse equipment before using.
4. Saltpetre will cause a curing reaction in the fresh product causing it to darken, looking old and stale. This process will reverse on cooking, giving the cooked product a raw cured appearance. Ascorbic acid can be used to enhance colour.
5. Meat quality is the most important factor in the manufacture of fresh products. The use of old/off meat will accelerate the deterioration of colour and product by bacterial growth.
6. Always rehydrate/dissolve the Batch Pack in some of the iced water to ensure an even distribution of spices, salt and most importantly, the preservatives in the ingredients.
7. Blunt or unpaired knives, blades and plates will cause:-
  - a) breakdown of muscle protein, allowing bacteria to multiply rapidly and cause spoilage and discolouration of products;
  - b) heat generation due to the friction, which may result in a pale grey product.

# Troubleshooting In Emulsion Products



Fat caps and jelly pockets, green rings and off-odours - these are the nightmares all processors want to avoid in their cured meats.

The following is a checklist to help you search for the cause and find remedies for problems you might come across in making emulsified products.

## Consistency Too Hard

This can be from a number of causes. Firstly, the percentage lean and/or connective tissue protein could be too high. This means that excessive rind material may have been used. It can be remedied by using the correct sausage formulation. The second cause could be that too little ice water was used. To remedy, increase the ice water quantity in the formulation. If one is manufacturing under a vacuum, the vacuum could be drawn at too high a level. To rectify this, reduce the vacuum time and intensity. If too much soya protein or starch was used, the consistency will also be too hard; correct the formulation and your problem will be solved.

## Consistency Too Soft

In this case, it means not enough connective tissue protein is going into the emulsion. Increase the percentage lean and the ratio of tendon rich meat. Sausage emulsion that is excessively processed in a bowl cutter destructs the connective tissue structure. Keep the required process temperatures in mind throughout the process. The bowl cutter must also be checked for mechanical defects such as blunt cutting edges on the bowl cutter knives. Another remedy to the problem could be to increase the percentage of soya protein or starch used in the formulation.

## Fat Caps And Jelly Pockets

This happens because of borderline or unstable emulsion that causes air to be incorporated during the cutting or filling process. These air pockets are then filled with gelatine if the emulsion has borderline stability. If too much collagen protein and insufficient salt myosin protein are used, fat caps and jelly pockets form too. High fat and high collagen ratios have similar consequences.

# Troubleshooting In Emulsion Products

## Fat Rendering, Fat Pockets And Greasing Out

### The breakdown of emulsion could be caused by:

- too much collagen protein used.
- too much frozen meat used.
- overcooking of product.
- too much frozen fat used.
- too much product rework.
- emulsion chopped for too long, so that not enough soluble protein is available to coat and stabilise the fat globules.
- emulsion at elevated temperatures.
- emulsion held too long under pressure before filling.
- emulsion overworked during transfer through pumps and pipes.
- product being underfilled.
- product not filled properly.

If frozen meat is held at  $-4^{\circ}$  to  $20^{\circ}$  C, the resulting formation of large ice crystals will rupture cell structure and denature the protein. Thus the binding capacity and emulsion stability will be reduced.

## Fat Rendering At Tip Of Smoked Sausage

### In this case the surface may have a slightly greasy touch as well. The cause could be:

- too much heat during cooking.
- too rapid heating.
- insufficient salt soluble protein to stabilise the emulsion.

With heating, fat globules expand while the protein firms and shrinks, thus the fat ruptures the protein matrix.

## Colour: Green Patches

- nitrite burn because of excessive use.
- nitrite burn because of improper distribution thereof.
- undercured due to too short a cooking time.
- undercured due to too low a temperature in the cold curing room.

## Colour: Surface Greening

**This happens because relatively salt resistant bacteria that are capable of growing at refrigerated temperatures, start growing. The causes could be one of the following:**

- improper hygiene of working surface.
- an improper cooking cycle.
- inadequate refrigeration of the finished product.
- freshly prepared products were exposed to product returns.

# Troubleshooting In Emulsion Products

## Discolouration In Products

**This means that air has been included into the casing by either:**

- a faulty filling machine.
- a damaged stuffing horn.
- air trapped in the meat emulsion as it was placed in the filler.

## Grey Spots

**This occurs commonly with discolouration because:**

- the curing phase is too short for colour development.
- of an insufficient thermal process.
- cooking was not in line with the casing calibre.

## Colour Faded Or Smeared At Time Of Filling

- meat was too warm during cutting in bowl cutter.
- meat was too warm during filling.
- sausage emulsion material left standing too long during the process.

REGAL VIENNA



## Troubleshooting In Emulsion Products

### Casings Break During Cooking

- correct core temperature of product exceeded.
- product is heated too quickly.
- percentage connective tissue used was too high.
- emulsion was kept in the cold room overnight causing the interior temperatures to be lower than normal.

In the case of heating the products too quickly, the surface sets and shrinks while the inside remains wet.

### Excessive Shrinkage

#### **This happens during cooking because:**

- too much fat was used.
- soft fat such as that of pork was over-chopped.
- excessive moisture-loss took place.
- the low water holding capacity of the emulsion.
- PSE pork was used.
- ingredients were not mixed for long enough.

### Wrinkling Of Casing

- After refrigeration dip into hot water (90° C) for ±5 seconds.

### BBQ BEEF SAUSAGES





# Troubleshooting In Emulsion Products

## Pale Products

### **This occurs when the:**

- curing dosage level was too low for thorough, lasting colour development.
- smoking process took place under too high a relative humidity.
- smoking process was not long enough.
- sausages are hanging too close together during the smoking process, thus smoke cannot penetrate all of the casing surface.

## Lack Of Flavour

This means the levels of spices and seasonings or salt are inadequate. Standardise flavourings by accurate weighing procedures, or use seasonings in pre-weighed unit Batch Packs.

## Musty, Weedy Off Odour

### **This means that there was bacterial growth due to:**

- insufficient salt.
- poor hygiene.
- abusive storage temperatures.

## Odour, Flavour Or Rancidity

### **This happens when:**

- raw materials are stored for too long and fat materials have already changed to a rancid state.
- there are air leaks in the package.
- storage life is extended for too long.
- the products were exposed to light for too long during storage.
- the product is still moist when packed.
- bacterial enzymes start growing.