

APPLICATION OF HACCP PRINCIPLES FOR THE MEAT INDUSTRY

GUIDANCE SHEET NO: 7

DESCRIPTION & INTENDED USE OF PRODUCT PRELIMINARIES FOR HACCP



DESCRIBE THE PRODUCT

The first principle of HACCP involves the identification of significant hazards associated with a food and the implementation of effective control measures to ensure that these hazards do not harm the consumer.

The correct identification and control of such hazards requires a thorough understanding of aspects of the product such as:

- physical and chemical properties of the food;
- the food packaging;
- conditions of storage and distribution;
- required shelf life;
- information to be provided to the consumer regarding appropriate storage, handling and use.

These factors are particularly important with respect to the control of microbiological hazards such as bacteria, which typically require moisture, favourable temperature conditions and time to grow to dangerous levels or produce harmful toxins.

The purpose of this preparatory stage therefore is to describe your products in terms of their suitability or otherwise to permit the growth of dangerous bacteria, so that adequate control measures can be identified and implemented at a later stage as part of your HACCP study.

Description of the product is normally achieved by considering two types of factors:

Intrinsic factors: those found within the product itself such as its structure and composition.

Extrinsic factors: those which are external to the food such as temperature control, packaging and method of processing.

It is helpful to think about your food in this way because any changes in recipes or ingredients are likely to affect the intrinsic factors, whereas changes in equipment or in the distribution chain are likely to affect the extrinsic factors. If full information about both factors is made available to the HACCP team they may choose to control an identified hazard by a change in the recipe, a change in the method of distribution or both.

The information gathered as part of the product description will be helpful to you when undertaking the hazard analysis of your products in Principle 1.2.

The description of the product has seven components, these are described below.

1. LIST ALL OF THE INGREDIENTS

A list should be made of all the ingredients found in each of your products. This list will be of assistance later in the study to ensure that all ingredients are properly documented for each product and is of particular relevance to the control and provision of correct information to the consumer of the presence of food allergens.

Example list of ingredients for a fermented dried shelf-stable salami

Ingredients	Supplier	Specification	Allergens
Beef meat	Meat Co	Insert number of any specification	None
Natural casing (lamb)	Meat Co	“ “ “	None
Milk powder	Dairy-ML	“ “ “	Milk
Salt	Condiment-LT	“ “ “	None
Spices	Condiment-LT	“ “ “	Includes mustard
Sodium nitrate	Preserv-Corp	“ “ “	None
Sodium nitrite	Preserv-Corp	“ “ “	None
Starter culture	Lacto-Cult	“ “ “	None

2. STATE THE PHYSICAL PROPERTIES OF THE PRODUCT

The physical properties of the food will influence whether dangerous bacteria will be able to grow in the food and/or produce dangerous toxins. The main factors to consider here are:

Physical state – Is the food a liquid, solid, foam, emulsion etc

Water activity (a_w) – this is the water that is available to microorganisms in the food. Whilst some foods may appear moist, the presence of sugar or salt in the liquid component of the food may prevent microorganisms from accessing the water thus restricting their growth. This is why the use of sugar, for example in jam making, or salt in the case of smoked salmon can be very effective at controlling the outgrowth of both spoilage and dangerous bacteria. Drying foods has an effect on both the moisture content and the a_w . Pure water has an a_w of 1.0 and the addition of salt or sugar will reduce this value closer to 0. Most bacteria require an a_w value > 0.92 to successfully grow in food but some moulds may be able to grow below this. The a_w value is most easily determined in liquid and homogenous foods where the sugar/salt content is likely to be evenly distributed throughout the food. Difficulties in determining a representative a_w value may arise in composite foods which contain different varieties of ingredient distributed in an uneven way through the food, for example a meat stew. This will be a matter for your HACCP team to consider.

pH – This is the measure of the acidity of a food and many bacteria are unable to grow in acidic conditions. For example, *Salmonella* species will typically grow well at neutral pH (7.0) but are unable to grow in acid conditions of 4.0 or below. As for a_w , care should be taken to ensure that any pH measurements taken are representative of the food. For example, in a ready meal the pH of the curry sauce may be 5.5, which would inhibit the growth of some bacteria, but within clumps of vegetables it might be 7.0 which might permit the outgrowth of dangerous bacteria.

Salt content – Whilst this affects the aw of the food, salt can also have an inhibitory effect on some bacteria in its own right.

All the above factors influence the growth of microorganisms in food but so does a combination of these factors together.

3. DESCRIBE HOW THE PRODUCT IS PROCESSED AND ANY PRESERVATION METHODS USED

Many traditional preservation techniques, if performed correctly, will produce safe food by the development of dry or acid conditions in the food. The most common types of process include:

Heat treatment – Microorganisms can be affected by heat in different ways. Some, such as *Salmonella* and *Campylobacter*, will be easily killed by normal cooking temperatures (70°C for 2 minutes) whereas others, such as *Clostridium botulinum* and *Bacillus cereus*, will survive such temperatures by forming spores

Hot smoking – Typically used for fish and meat products at temperatures of approximately 70°C – 80°C and often used in combination with brining

Brining – Can involve the immersion of food into salt water or the direct application of salt crystals to the outside of the food

Drying – used for a range of products including milk, egg, herbs, fish and meat products

Fermentation – the production of alcohol and/or acids in foods, used in the production of meats such as salami as well as in bakery and brewing products.

4. DESCRIBE HOW THE PRODUCT IS PACKED AND THE PACKAGING MATERIALS

Some methods of packaging will affect the nature and likelihood of food hazards associated with a food. For example, hot filling product into glass jars or the use of vacuum packing will create anaerobic conditions (reduced oxygen levels) which will favour the growth of certain bacteria such as *Clostridium botulinum*. If you are using such materials, then your HACCP team will need to identify suitable controls to prevent the outgrowth and toxin formation by these dangerous bacteria.

The packaging may also emit gases or absorb them from the food, again changing the conditions for growth by microorganisms. Packaging could also protect microorganisms from damage by sunlight. The use of glass containers may introduce an additional physical hazard, especially if they are reusable, whereas the use of aseptic filling lines may reduce the likelihood of contamination from the environment.

5. HOW IS THE PRODUCT GOING TO BE STORED AND DISTRIBUTED?

The main options for storage and distribution are:

- ambient
- chilled
- frozen

Some common hazards will be controlled by freezing food, for example bacteria will not grow at frozen temperatures and most parasites, for example those found in fish, are destroyed by prolonged freezing of food. However, the storage and distribution of chilled foods may introduce additional hazards, such as *Listeria monocytogenes*. Prolonged ambient storage may render some foods susceptible to mould growth and toxin formation.

6. WHAT IS THE SHELF-LIFE OF THE PRODUCT?

The shelf-life that you assign to your products should be sufficiently long to allow your customers to make full use of them. However, in general, the longer the shelf-life of a product, the more likely it is to spoil within date and the more food safety hazards it will present. As such it is advisable to think carefully about the need for an extended shelf-life and it may be appropriate to undertake shelf-life testing to verify that the products perform as expected throughout their shelf life.

Durability date

If you are satisfied that no food safety issues will be presented by your products at the end of their, shelf-life, you should assign a “Best Before” date to the product. If, however, the food is likely to present a danger to health on expiry of the durability date, a “Use by” date should be applied.

7. CUSTOMER ADVICE

You should consider whether instructions for the storage, handling and preparation of the product are necessary to ensure the safety of the consumer. Such instructions should be in addition to other control measures introduced during manufacture and might include:

Storage instructions prior to opening packaging

“Store in a cool dry place”

“Keep refrigerated”

“Keep frozen”

Storage instructions once packaging has been opened

“Once opened, keep refrigerated and use within 3 days”

Cooking instructions

“Cook at 200°C for 30 minutes. Check that food is piping hot before serving”

IDENTIFY THE INTENDED USE OF THE PRODUCT

The HACCP team need to have a thorough understanding of the intended use of the product(s) included in the HACCP study so that they may undertake an accurate hazard evaluation as part of the Hazard Analysis. How is this stage achieved?

There are two key factors which are relevant here:

- A. The nature of the intended customer.
- B. The extent of any further processing of the food prior to consumption.

A. NATURE OF THE INTENDED CUSTOMER

You should consider whether the product is intended for supply to other food businesses or direct to the final consumer. You should also consider whether target consumers fall into one of the following vulnerable groups. Ask yourself “Do the consumers of my product have a particular food safety requirement?” It is your responsibility to understand your target group and increase your knowledge and awareness of hazards (physical, chemical, biological and allergens) that are of a particular concern to the vulnerable group/s. The major vulnerable groups are summarised in the table below.

Vulnerable Groups of Consumers

Vulnerable Group	Considerations
Allergen Suffers	Is the product intended to be consumed by sensitive groups who may be allergic to specific food ingredients. Are claims such as “free from” made on the product label and if so are such claims substantiated? Disclaimers such as “May Contain” should only be made where a thorough risk assessment identifies a residual risk of contamination by a food allergen after all reasonable control measures have been applied.
Young	Infants and young children are regarded as a vulnerable group when it comes to food safety. You need to think about what additional hazards may be specific to this target group (e.g. type of food, size of food, choking hazards, mineral levels).
Elderly	If elderly people are going to consume the product think about hazards that are specific to this group. Older adults are more susceptible to foodborne illness. The immune system often weakens as you get older and stomach acid also decreases, stomach acid plays an important role in reducing the number of bacteria in our intestinal tracts and the risk of illness.
Pregnant	There are some foods that pregnant women are advised to avoid consuming because they can make the woman ill or harm the unborn child. These include unpasteurised dairy products and lightly/partially cooked processed meat products.
Immunocompromised/ immunosuppressed/ immune deficient	Is the product to be consumed by people that have an impaired immune response (for instance those undergoing chemotherapy or have AIDS, premature infants or transplant recipients that take drugs to prevent their body from rejecting the new organ). Consideration should be given to that fact that the immune system may be prevented from attacking harmful microorganisms in food.

The HACCP team should also consider the possibility of abuse/unintended use of the product by the customer or final consumer.

B. EXTENT OF ANY FURTHER PROCESSING PRIOR TO CONSUMPTION OF THE PRODUCT

Different microbiological criteria will apply depending on whether the food product is supplied raw, processed or ready to eat to the final consumer. The HACCP team will need to clearly define which of these categories applies to the food and what, if any, instructions will need to be provided to the customer to assure the safe consumption of the food.

For example, if the product is supplied to the customer as a ready to eat food, this should be clearly stated on the labelling. Most importantly, however, the HACCP team will need to ensure that any decisions made during the hazard analysis element of the HACCP study takes into account the fact that the food will receive no further processing prior to consumption. Critical control points identified by the HACCP team in the production of such foods will need to “prevent or eliminate” hazards arising from the presence of pathogens such as *Salmonella* and *E.coli* o157.

For other types of food, clear information, typically on the food label, should be provided to the consumer where steps are required to be taken prior to the consumption of food to make it safe. For example, a product containing raw poultry should be clearly labelled as such and include clear, validated cooking instructions. It may be that the identified critical control points for a raw or processed food are sufficient to reduce a hazard, such as *Salmonella*, to an “acceptable level” rather than total elimination because the food will be subjected to further processing by the customer.