



FOOD SAFETY SUPPORT

Alberta Agriculture and Rural Development has a team of food safety specialists available to assist you to assess and improve your food safety programs.

www.agriculture.alberta.ca/aha

Contact 780-427-4054
or toll free 310-0000.

Improving food safety programs is a good business decision as doing so can enhance food safety, quality and consumer confidence; reduce waste and recalls; and open doors to additional markets.



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As a processor, keep in mind the following when considering spice quality:

- As fresh as possible is best. The best before date is a good guide to help identify the freshness of a spice. Whole to ground spices have at least a 12 to 24 month shelf life under cool and dry conditions. If a product is close to the end of its shelf life, it is recommended that you not buy it, or if it is in your inventory, dispose of it.
- The consistency of the spice can have a large effect on the end quality of meat products. Inconsistency in spice size, desired colour level, or variety can cause visual and flavor differences in final products. It is up to the spice supplier to consistently supply the same type, variety and quality of product. It is not a good idea for the meat processor to switch spice varieties due to cost reasons if a consistent final product is to be obtained. For example, 32 mesh table black pepper and 60 mesh fine black pepper are the same black pepper, but can result in a large difference in the end product if they are substituted.
- Spice is sterilized through very intense processes such as irradiation or steam sterilization to reduce the microbial load to standardized levels. Microbial load is usually not a concern in cooked meat products because most microbes are killed during the cooking process. However, microbial load of a spice is something to consider if used in meat products sold raw, such as a marinated cut of meat. Spice with a higher microbial load can cause earlier spoilage of raw meat products than another spice that has a lower load. Discuss with spice suppliers whether a spice product with a lower microbial level product is available for these types of products.
- Observing how the spice was transported at a facility is important to determine how it may affect spice quality. For example, spices should not be transported with a mixed load of freight as they could pick up the flavor of materials during transport. Spices should be handled and loaded with care to minimize any damage to the product. For example, it would not be a good idea to transport fragile parsley leaves under a heavy load of other products otherwise you will get a fine powder of crushed parsley leaves on the bottom of the skid.
- Cool and dry storage cannot be emphasized enough. A spice room is too often located in or near a boiler room or wet processing area, where heat and moisture can ruin spice. Rancidity is promoted by hot conditions, as is microbial growth, especially when spice is exposed to moisture. In either case, using a spice that is rancid and/or has a high microbial load in a recipe will cause product quality to suffer. Separate airtight containers in a temperature and humidity controlled area of the facility is ideal.

Herbs and spice are like any other ingredient in a processor's operation: with proper controls implemented at the supplier and the facility level, products will be maintained at the peak of safety, quality and flavor.

Food Safety Sentinel is now available on-line by visiting the Alberta HACCP Advantage (AHA!) website at www.agriculture.alberta.ca/aha and clicking on the link to the Food Safety Sentinel newsletter.

References:

- ¹ Ian Hemphill (2006), The Spice and Herb Bible. Second Edition Toronto: Robert Rose Inc. pp.23-25
- ¹ Canadian Food and Drug Regulations [C.R.C., c. 870], B.01.010 (3)(b)
- ¹ Canadian Food and Drug Regulations [C.R.C., c. 870], B.01.009 (2)
- ¹ Good Manufacturing Practices (GMPs) for the 21st Century - Food Processing, Section Two: Literature Review of Common Food Safety Problems and Applicable Controls, Center For Food Safety and Applied Nutrition August 9, 2004 <http://www.cfsan.fda.gov/~dms/gmp-2.html>

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FOOD SAFETY SENTINEL



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SPICE OF LIFE SAFETY AND QUALITY CONCERNS WITH SPICE

Every processor's recipes are closely guarded secrets. Only the processor knows which exact spices and amounts of spices are added to a mix to produce each unique signature product. It is usually the spice and herbs that are essential to the distinct flavor of each recipe.

On the other hand, spice and herbs can be incorrectly treated as low value commodities. Buying and handling them without thought as to how the spice and herbs will affect the food safety and quality of the end product can be a risk for a small processor.

Definition of Spice and Herbs

There is some confusion about the difference between herbs and spices, mainly because the terms are used interchangeably in everyday speech.

When used in cooking, an herb is generally defined as the leafy part of a plant. Basil, oregano and thyme would all be considered herbs. Spice is any other part of the plant such as the seeds, stems, roots, etc. Ginger (a root) and cinnamon (a tree bark), for example, are both considered spice.

Food Safety Concerns

Food safety controls three types of hazards: physical, microbial and chemical. Examples of hazards associated with spice and herbs are:

- **Physical hazards** such as rocks, metal and glass that may be present in the spice and cause broken teeth, cuts to the mouth, throat and stomach. Another concern is that such hazards, if present in spice, could damage processing equipment and create a new hazard. For example, if a rock chipped a grinder blade, it could cause metal fragments from the grinder to be in the final products.
- **Microbial hazards** - presence of pathogenic microbes such as E. coli and Salmonella can occur as spices are usually grown close to, or in the ground. If pathogens are present in the spice, and proper food handling and cooking methods in meat processing operations are not followed, anyone consuming the product could become ill.
- **Chemical hazards** such as pesticides, environmental contaminants, natural toxins and food additives that are unapproved, inappropriately used or found above acceptable limit. Contamination and adulteration of spices has been a global concern as considerable amounts of spices are imported from hot countries. Most countries have made changes to their import legislation following the detection of chemical dye Sudan Red (generally used by the textile industry) to add colour to the chillies and chilli powder.

FUNCTIONS OF SPICE AND HERB IN MEAT PRODUCTS

Flavor – the primary use for spice and herbs in processed meats is flavor. Spice flavor is determined by their content of etheric oils. These oils are called volatile oils and have the tendency to evaporate under conditions of warmth, open-air flow and light. Excessive humidity can also be a negative factor. To retain flavor, spice and herbs should be kept cool, dry, airtight and with no influence of bright light.

Color – Spice is also added as the only legal colorant in processed meats. An example would be the use of ground paprika in pepperoni.

Antioxidant Activity – Several spice and herbs show antioxidant activity but rosemary is one of the most widely used in this function. At levels of 0.05 to 0.1 percent, they can inhibit rancidity and extend shelf life. Ground mustard seeds also have antioxidant activity but are normally added as a protein source.

Protein Source – Ground deheated mustard, which contains 25 to 30 percent protein, is extensively used as a source of non-meat protein. Deheated means that a heat process treats the ground mustard seeds in order to inactivate the enzymes that make the ground mustard hot.

Food safety is very important for spice processors. They do their best to ensure risks are reduced to acceptable levels or eliminated. A reputable supplier will have systems in place to control hazards.

Controls measures used at the spice manufacturer level may include:

- Product screening, metal detection and visual inspection for physical contamination;
- Antimicrobial treatments such as steam, ethylene oxide and even irradiation control;
- Regular microbial final product testing;
- Chemical or pesticide residue testing; and
- Fully traceable lot and batch numbers as part of a complete recall program.

Despite controls at the spice manufacturer level, it is still important for meat processors to use plant-specific food safety controls. Processors know meat and meat products but they might not be clear on the important food safety concerns associated with spices. It pays to understand these concerns because spices can have such a huge impact on a processor's business. Many pathogens, like E. coli and Salmonella, enter the food processing environment via raw materials contaminated with those pathogens. Raw material contamination can affect any industry, but is more common in meat industries.

There are numerous preventive controls that a meat processor can apply to address the hazards. Some controls minimize the risks of raw material contamination (e.g., ensuring that raw material suppliers have good food safety programs in place) and others (e.g., cooking) involve a kill-step to eliminate any pathogens that may be present.

Depending on the risk level of your products, and the volume of spice you use, you should consider using these food safety control measures for spice in your operation:

- Purchase spices from reputable suppliers. Inquire about their food safety programs, and ensure the spices are treated (i.e., irradiation, ethylene oxide) to reduce the initial microbial load;
- Request specification sheets for each type of spice you purchase. This will detail the important specifications your supplier is meeting. For more information about the most popular specifications for spice and herbs you can refer to the Canadian Spice Association website: http://www.canadianspiceassociation.com/csa_library.asp or the American Spice Trade Association website: <http://www.astaspice.org>
- Conduct a visual inspection of transportation vehicles upon receipt to ensure that they are free of chemical contamination, rodents, flies or other pests;
- Examine spice packages at receiving; check for general condition (dry, not damaged), physical contaminants (i.e., dust, wood), and pest infestation. Reject soiled or infested packages;
- Check labels on packages to ensure the supplier has sent you the correct product and not a substitute;
- Follow FIFO (first-in first-out) storage practices. To ensure proper rotation, record the receiving date on the package and make sure it is easily visible;
- Spice storage rooms should be cool, dry and clean; According to the Canadian Spice Association, cool means no higher than 20°C and dry is no higher than 60% relative humidity;
- Store packages off the floor. Containers used for partially used ingredients should be clearly labelled so that the spice can be identified. If the spice is transferred from the original packaging, ensure that the lot number is recorded and containers in use are properly closed;
- Depending on the volume of spice being used you may wish to screen the spice when adding it to your process. This is an effective way to catch any physical contaminants that may be present; and



- For traceability purposes, ensure you record lot numbers of the spice used during production on your batch sheets (or production records). If there is a problem with the spice you will know what products you put it in and can recall the products if necessary.

Quality Concerns

The safety and quality of spice are two concepts that are important for processors to know, but they are often confused as the same thing.

Safety and quality do have areas that overlap. Usually it is not possible to have an unsafe product that has acceptable quality, but is possible to have safe products that vary in quality, or to put it in more familiar terms, different grades of quality.

Spice quality can be defined as the characteristics of the spice that are acceptable, both internally and externally.

Examples of quality characteristics to consider:

- Physical – correct appearance (colour, texture, granulation), variety
- Microbial – microbial load at required levels
- Chemical – the volatile oil content of the spice, possibility of rancidity

Similarly, just as two animal carcasses will not be exactly the same regarding the quality of meat, there is variability in spice from lot to lot and season to season. As soon as a spice is harvested and processed, it undergoes natural changes in which its structure and composition slowly deteriorate.

Spice suppliers have established standards, which take into account the variability of the products and these are used to ensure consistency in the spice. Your supplier requires that you provide details of your needs in order to offer the correct fit of product, requirements and price for you.

SPICE AND HERB LABELLING

In Canada, it is common and acceptable to lump spice and herbs together under the label of "spice". If you wish to label your product as containing "herbs and spice" or "spice and herbs", you may do so. But your product's label should contain both. Otherwise, simply "spice" will do.

The federal *Food and Drug Act* does not require the individual components of spice mixtures, or seasoning and herb mixtures, to be spelled out in the ingredient list, except in cases where there might be an allergen concern. This means that each individual spice does not have to be disclosed on the label. For example, if the "secret recipe" contains cinnamon, coriander and basil, the label could simply say that the product contains "spice". In the event that a spice is a major defining ingredient in a product, for example "Garlic sausage", it is acceptable to label the spice "spice including garlic powder" or simply list the garlic powder separately on the label.