Preservation of Meat and Poultry Products
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Food preservation is a method of maintaining foods at a desired level of properties or nature for their maximum benefits. Preservation usually involves preventing the growth of bacteria, yeasts, fungi, and other micro-organisms (although some methods work by introducing bacteria, or fungi to the food), as well as retarding the oxidation of fats which cause rancidity. There are various methods of preservation chilling, freezing, curing, smoking, dehydration, canning, radiation preservation etc. Chilling is most widely used method for preservation for short term storage of meat because chilling or refrigeration slows down the microbial growth and enzymatic as well as chemical reactions. Freezing is the method of choice for the long term preservation of meat. It has advantage of retaining most of the nutritive value of meat during storage. Meat smoking was known to man as an aid in preservation for a long time. Smoke contains a large number of wood degradation products such as aldehydes, ketones, organic acids, and phenols etc. which exert bacteriostatic affect besides imparting characteristic smoky flavour. Canning is a process of preservation achieved by thermal sterilization of product held in hermetically sealed containers. Canning preserves the sensory attributes such as appearance, flavour and texture of the meat products to a large extent. Freeze drying of meat is a satisfactory process of dehydration preservation due to better reconstitution properties, nutritive quality and acceptability. It involves the removal of water from the frozen state to vapour state by keeping it under vacuum and giving a low heat treatment. Maintaining or creating nutritional value, texture and flavour is an important aspect of food preservation, although, historically, some methods drastically altered the character of the food being preserved. Meat and poultry products are chilled immediately after slaughter to acceptable internal temperatures which insure the prompt removal of the animal heat and preserve the wholesomeness of the products. As such, due to the recent up gradation of preservation techniques, the preservation industry is also growing almost at the same rate as the food industry which is about 10 to 12% per year.

Some of the major aspects of the book are principles of various preservation techniques, standards and quality control measures for meat, meat food products order, eating quality and sensory evaluation of meat, preservation of poultry meat, utilisation of poultry industry by products, mixed poultry by products meal, structure, composition and nutritive value of eggs, luncheon meats, meat loaves, and meat spreads, barbecue style pork loaf using non fat dry milk, canned corned beef products, salisbury steak with textured vegetable protein, general instruction to be observed for processing canned items under steam or under the combination of stream and water pressure, spaghetti and meat balls in tomato sauce with cheese, etc. Different preservation techniques are being developed to satisfy current demands of economic preservation and consumer satisfaction in nutritional and sensory aspects, convenience, absence of preservatives, low demand of energy and environmental safety. The present book contains various processes of meat and poultry preservation. All the entrepreneurs, technocrats, persons evolved in meat and poultry processing will be benefited from this book.

Content:
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Sloppy Joe with Textured Vegetable Protein
Sauce Formulation
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Meat Loaf with Textured Vegetable Protein
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Meat Loaf with Textured Vegetable Protein
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Beef Patties with Textured Vegetable Protein
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Beef Patties with Textured Vegetable Protein
Meat Patties with Textured Vegetable Protein
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Prepare Sauce
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To Prepare Meat
To Prepare Dressing
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Prepare Meat Balls
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Prepare Gravy
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Prepare Meat Balls
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Prepare Sauce
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Chill
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Prepare Cheese Sauce
Prepare Macaroni
Pack
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Prepare Meat
Prepare Egg Noodles
Prepare Gravy
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Prepare Pork and Beans
Prepare Sauce
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Prepare Beans
Prepare Meat Balls
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Chili Mak (Cold Pack)
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To Prepare Sauce
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Prepare Gravy
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Frozen Beef Pot Pies
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For Chopped Vegetables with Beef
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Frozen Barbecued Ribs
Prepare Sauce
Barbecue Ribs
Frozen Sliced Beef in Barbecue Sauce
Prepare Meat
Prepare Sauce
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Prepare Sausages
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Prepare Meat Balls
Prepare Sauce
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Prepare Meat Balls
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Prepare Sauce
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Canned Condensed Chicken and Noodle Soup
Canned Condensed Chicken Broth with Rice
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Prepare Beef and Noodles
Prepare Base
Fill
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Prepare Base
Prepare Vegetables and Meat
Fill
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Canned Condensed Cream of Chicken Soup
Canned Condensed Chicken Vegetable Soup
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Prepare Soup
Fill
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Prepare Vegetable Macaroni Mixture
Prepare Soup Base
Fill
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Canned Condensed Cream of Celery Soup
Canned Condensed Cream of Asparagus Soup
Canned Condensed Cream of Spinach Soup
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To Reconstitute
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Beef Noodle Soup Mix
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Recommended Use
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Cream of Chicken Soup Mix
To Rehydrate
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To Rehydrate
Chicken Noodle Soup Mix (Paste Style)
To Rehydrate
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To Reconstitute
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To Reconstitute
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To Reconstitute
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Canned Barbecue Sauce
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Prepare Dumplings
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Canned Ham and Dumplings
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Canned Chicken Noodle Dinner
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Canned Chicken, Mushroom and Macaroni
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Prepare Chicken and Smoke
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Turkey Loaf
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Chow Mein with Chicken Flavored Textured Vegetable Protein Dice
Smoked Chicken
Poultry Sausage
Chicken Frankfurters

Sample Chapter:
Preservation and Maintenance of Eggs

A freshly laid egg can be assumed to have a highest quality. Since egg is full of essential nutrients, deteriorative changes soon start taking place which may pose a danger to the excellent sensory attributes of this nourishing and satisfying food item. Cleanliness and soundness of shell is the first step to assure the quality of egg to the consumers. The shell quality deficiencies mostly relate to the production practices adopted at the farm. Proper handling of eggs can delay the decline in the quality. Following precautions should be taken during handling of eggs:

1. Eggs should be collected 3 to 4 times per day. This will result in less dirty eggs and fewer breakages.
2. After collection, eggs should be shifted to holding room maintained at a temperature of about 15°C and 70 to 80% RH at least for 12 hours.
3. Eggs should be properly packed in filler flats with broad end up. Bulk packing should be done in fibre board cartons.
4. Eggs should be rapidly moved through the marketing channel so as to reduce the period between production and consumption.

All preservation methods for shell eggs have been designed to retard one or more of the following physico-chemical alterations which lower the quality of egg as it ages:

1. As the surface of egg dries, the keratin cuticle shrinks and size of shell pores increases rendering it easier for gases and micro-organisms to pass in and out of the shell.
2. As the warm egg cools down, the egg contents also contract, resulting in the formation of air cell.
3. The breakdown of carbonic acid causing loss of carbon dioxide from the albumen is rapid during the first few hours after an egg is laid. The alkaline pH acts on the mucin fibres to disturb the thick gel of albumen making it thin or watery.
4. As the egg ages, water migrates from the albumen to the yolk which may overstretch, weaken or even rupture the vitelline membrane.

Following preservation methods are employed to maintain the quality of shell eggs:

**EGG CLEANING**

Earlier, it was a general practice to dry-clean dirty egg shells by abrasive mounting on a mechanical wheel. This practice has now become obsolete because it weakens the shell. These days washing in warm water containing a detergent sanitizer is an effective way of cleaning the eggs with dirty shells. A temperature difference of 10-15°C between eggs and wash water is ideal, otherwise there may be problem of crack shells. Besides, eggs should not be immersed in warm water for more than 3-4 minutes. After washing, the eggs should be dried promptly. Wash water should be changed after washing every five to six baskets of eggs. It should be emphasised that only dirty eggs are subjected to washing. It not only reduces the microbial load on the egg shell surface but also improves the appearance and consumer appeal.

**OIL TREATMENT**

Oil coating spray of eggs has become very popular for short term storage of this commodity. Coating oil forms a thin film on the surface of the shell sealing the pores. It should be done as early as possible, preferably within first few hours after laying of eggs because loss of CO2 is more during this period and evaporation of moisture is also more during the first few days. Egg coating oil should be colourless, odourless and conform to food grade. Coating is done by dipping the eggs in the groundnut oil whereas for oil spray, the eggs are arranged in the filler flats with their broad end up. If the eggs need washing, oil coating should be done after washing. It is important to drain out excess oil before packaging. The temperature of oil should be in range of 15 to 30°C for ideal results. Oil treatment safeguards the quality of albumen for at least 7 days because it effectively seals the shell pores.
COLD STORAGE
This method of preservation is suitable for long term storage of clean eggs in the main laying season and abundant availability. The temperature of cold store is maintained at 0°C (32°F) and relative humidity between 80 to 85 per cent. An anteroom with intermediate temperature is generally provided to check condensation of water vapour on the eggs during removal. Use of new egg packing trays are advised for cold storage. Like all other animal products, eggs also pick up strong odour, so the same cold store cannot be used for storing onion, garlic or any other commodity with strong odour. The quality of shell eggs can be maintained for about 6 months in a cold storage. Oil coating of eggs prior to cold storage can further enhance their keeping quality. Such eggs could keep well at 14°C and 90% RH for a period of 8 months.

THERMO-STABILISATION
This preservation method involves stabilisation of albumen quality by holding the eggs in an oil bath maintained at 55°C for 15 minutes or 58oC for 10 minutes. This process brings about coagulation of thin albumen just below the shell membranes, thereby blocking the passage of air and moisture. In addition, oil coating of shell pores also takes place. Thus keeping quality of eggs is maintained for sometimes and thinning of egg white is retarded. Alternatively, eggs are immersed in hot water at 71°C for 2 to 3 seconds. In this flash heat treatment, bacteria present on the surface of the shell are destroyed and a thin film of albumen just below the shell membrane is coagulated sealing the egg shell from inside.

IMMERSION IN LIQUIDS
Under rural conditions, lime-water or water-glass immersion are most useful. In lime-water treatment, a litre of boiling water is added to 1 kg of quick lime and allowed to cool. Now 5 litres of water and 250 g of table salt are added to it. The solution is strained through a fine cloth when the mixture settles down. Eggs are dipped in the clear fluid overnight and then dried at room temperature. In this process, an additional thin film of calcium carbonate is deposited on the egg shell and seals the pores. Such eggs can be stored for a month at ambient temperature. In water-glass treatment, one part of sodium silicate is mixed in 10 parts of water and eggs are dipped overnight. In this process, a thin precipitate of silica is deposited on the egg shell and partially seals the pores.

It is clear from the above discussion that eggs should be collected frequently, held initially at low temperature and then a suitable preservation method be employed to maintain its keeping quality for anticipated consumer acceptance.