

Subject: Food Technology

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Paper No. : 10 Technology of Spices and Condiments

Module : 16 Chillies: Quality Attributes Of Paprika



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Description of Module	
Subject Name	Food Technology
Paper Name	10 Technology of Spices and Condiments
Module Name/Title	Chillies: Quality Attributes Of Paprika
Module Id	
Pre-requisites	
Objectives	
Keywords	

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16.1. Introduction

Pepper (*Capsicum Annul*, L), also called bell pepper, chilli, chillies, aji, pimiento, paprika, and capsicum are a warm-season crop that is a member of the Solanaceae family. Sweet bell peppers are green at the immature stage (when most are sold) and turn red, gold, purple, orange, and/or brown as they ripen. Because sugar content increases as they ripen, colours peppers tend to be sweeter than green peppers. The most notable feature of peppers is flavour, which can be sweet, mild or strongly pungent. Sweet bell peppers are available year-round, with California Wonder being the most common cultivar.

Chilli peppers occur in a number of varieties that vary greatly from mild to very hot, which is determined by capsaicin content. These include: Ancho, anaheim, cayenne, cherry hot pepper, cheese, fresno (red and green), habanero (red, green and orange), jalapeno, poblano, serrano (green and red), yellow, chiltepin, cuban, long wax, new mexican, tabasco, thai, etc. Some chilli peppers are dried and sold individually or tied together in ornamental arrangements.

Peppers are eaten raw in salads and salsa, processed by canning, freezing, pickling, and dehydrated and powdered to produce paprika and chilli powder. Unlike the U.S., most European paprika is mildly pungent. Chilli powder prepared at different levels of pungency is usually comprised of ground, dried, pungent peppers mixed with other spices, such as oregano, cumin, and garlic. Various pepper forms, usually chilli types, are extensively used in combination with other spices such as turmeric, cumin, and coriander to produce curry powder, the pungency of which depends on the pepper cultivars used. For instance, Cayenne powder is a high-pungency condiment produced from dried mature fruit of cayenne-type cultivars.

16.2. Quality Characteristics and Criteria:

Good quality sweet bell peppers should be of uniform shape, size and colour typical of the variety. The flesh (pericarp) should be firm, relatively thick with a bright skin colour and sweet flavour, and free from defects such as cracks, decay, and sunburn. Peppers that are shrivelled and dull-looking or pitted should be avoided. The same quality criteria apply to fresh chilli peppers. Dry lines or striations across the skin indicate a hotter pepper. These lines are not an indication of poor quality.

16.2.1. Horticultural Maturity Indices

Criteria for the maturity of green peppers include fruit size, firmness, and colours. For coloured peppers the additional criteria of having a minimum of 50% coloration is important.

Chilli peppers are harvested by hand. They are generally picked when ripe and then dried and allowed to equilibrate in moisture content in covered piles. The major peppers dried are hot red peppers for cayenne and occasionally pimientos for paprika. The pods may be sliced before drying. This shortens drying time and improves

colour and flavour. Seeds may be removed by screening and water sprays. Whole peppers are also dried until brittle and the seeds/pulp are completely dry. The dried product is used in flavouring and improving the appearance of various products, included canned products. Some sliced peppers are partially dried and mixed with salt for preservation for ultimate use in various processed products.

16.2.2. Grades, Sizes and Packaging

Grades for fresh sweet bell peppers include U.S. Fancy, U.S. No.1 and U.S. No. 2. Not all sweet peppers are graded; ungraded peppers are “unclassified.” Differences between grades are based primarily on external appearance. Sizes include Small, Medium, Large, and Extra Large/Jumbo. Cardboard boxes commonly hold 6.8 to 15.9 kg (15 to 35 lb) of randomly packed peppers. Very high quality peppers are often marketed in 5 kg (11 lb) flat cartons with one or two layers of fruit. There are no U.S. grades for chilli peppers.

6.2.3. Pre-cooling Conditions:

After harvest, fresh market peppers should be rapidly cooled to no lower than 7 °C (45 °F) at high RH to reduce water loss and shrivel. Pre-cooling can be done using forced-air, hydro-cooling or vacuum-cooling. Properly vented cartons are required to facilitate forced-air cooling. If hydro-cooling is used, care should be taken to prevent development of decay. High RH is necessary to avoid desiccation. Waxing has been used to reduce desiccation, but it tends to increase bacterial soft rot. Shelf-life varies among different pod types. Deterioration is often due to moisture loss, with some pod types more prone to desiccation than others.

16.2.4. Optimum Storage Conditions:

Fresh peppers can be kept for 2 to 3 weeks at 7 °C with 90 to 95% RH. Storage-life can be extended another week by packaging in moisture-retentive films at 7 to 10 °C. Peppers are subject to chilling injury when stored below 7 °C and to accelerated ripening and bacterial soft rot when stored above 13°C. Storage at 5°C reduces water loss and ripening, but after 2 weeks chilling injury will appear. Some pepper cultivars can be sensitive to chilling if stored at 7°C, so a good storage temperature range should be 7°C to 13 °C.

16.2.5. Controlled Atmospheres (CA) Considerations:

Peppers derive a slight benefit from CA storage. Low O₂ atmospheres (2 to 5% for bell and 3 to 5% for chilli) retard ripening and respiration during transit and storage, and have a slight benefit on quality. At 10°C, high CO₂ (> 5%) can cause calyx discoloration, skin pitting, discoloration and softening in both bell and chilli peppers. A 3% O₂ + 5% CO₂ atmosphere is more beneficial for red than green peppers stored at 5 to 10°C for 3 to 4 weeks. Before processing, chilli peppers can be stored under 3 to 5% O₂ + 15 to 20% CO₂ for up to 3 weeks at 5°C without

appreciable chilling injury or quality loss. Freshly harvested chilli or other hot peppers should be stored under the same temperature and RH conditions as sweet peppers.

