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COIMBATORE-641 035, TAMIL NADU

19FTT302 & FOOD SAFETY AND QUALITY REGULATIONS

UNIT II FOOD QUALITY AND QUALITY EVALUATION OF FOODS

Quality Assessment of Food materials-Fruits, vegetables, cereals.

Parameters of Quality

There are three parameters of quality

1. External : appearance, feel, free of defects
2. Internal : odour, taste, texture
3. Hidden : wholesomeness, nutritive value and safety

Now let's take e.g. of Citrus fruit and describe its external quality



Good quality - Healthy citrus fruit



Poor quality - citrus fruits

Fig. 1: Quality of Citrus fruits

1. External Quality of citrus

Fruits should be:

- Intact

- Free of bruising and/or extensive healed over cuts
- Sound, no cracks, bruises, sun scald etc.
- Good quality - Healthy citrus fruit Poor quality - citrus fruits
- Quality red tomatoes Green tomatoes
- Clean practically free of any visible foreign matter
- Practically free from pests
- Practically free from damage caused by pests
- Free of signs of internal shriveling
- Free of damage caused by low temperature or frost
- Free of all abnormal external moisture

2. Internal quality of citrus fruits

- Free of any foreign smell and/or taste
- Should be sweet and sour to taste

3. Hidden quality

- Total soluble solids (TSS)
- Acidity
- Vitamin C
- Vitamin A content

Now let's take one more example say Tomato and define its external, internal and hidden quality.

1. External quality



Quality red tomatoes



Green tomatoes

- Shape - Round/globe/flattened
- Absence of blossom end scar and growth cracks
- Uniform colour (orange-red to deep red; light yellow). No green shoulders.

2. Internal quality

- Free of any foreign smell and/or taste
- Firm and presses when pressed with hand pressure. Not soft and easily deformed due to an overripe condition
- Number of seeds in cavity

3. Hidden quality

Total soluble solids, Acidity, Vitamin C, Vitamin A content.

Quality Evaluation

Quality evaluation means methods, which help you to judge quality.

You can judge quality by two methods:

i) Sensory methods

ii) Objective methods

i) Sensory methods: Often we take the help of our sense organs to judge the quality. Various sensory parameters are- appearance, colour, taste and aroma (flavor) and texture. We can see the fruits and vegetables and can describe their colour as green or red etc. By simply looking we can identify and say whether they are fresh or not. We can smell the fruity flavour through our nose.

ii) Objective methods: You can also measure colour, flavour, texture and nutritive quality with help of instrument. However, sensory method is the best method for judging the quality.

Specifications for cereals

There are at least 330 specifications for cereals and cereal products at national and international level (over 50 countries or regions) of which at least 12 are applicable globally. The criteria assigned to grains are the intrinsic varietal qualities and those which are environment- or process induced.

Intrinsic Qualities

Colour: Cereal grains are pigmented and range through the colour spectrum from very light tan or almost white, to black. Where extractive milling is required, highly-pigmented varieties may give low yields of white flour.

Composition: Composition, e.g. protein, carbohydrate, lipids and their breakdown products, qualitatively influences product acceptability, by affecting texture and taste. Quality changes evolve slowly in stored grain and more rapidly in milled or processed intermediary products. Some grain components, for example husk, are inedible and quantitatively influence product yield and gross nutrients available to the consumer.

Bulk Density: Each type or variety of grain when in optimum health, fully mature, etc. has a characteristic bulk density.

Odour, aroma: Most grain types, when fresh, have a distinctive natural odour or aroma. This is generally accepted as an indicator of good quality, although some people prefer grain which smells 'old' or even fermented.

Size, shape: Rice, as a whole-grain food, is classified by size (length) and shape (length: breadth ratio). Other grains also have its size considered in their specification. In general a small range in size assists with processing and handling.

Induced Qualities

Age: During the post-harvest phase, grain undergoes complex biochemical changes termed 'aging'. Changes to carbohydrate, lipids and protein fractions result in, for example, firming of texture in rice on cooking, and increased gas-retention

capability in wheat flour. For most consumers, the effects of these changes are considered to be desirable. When plotting consumer acceptability of a grain product against its age since harvesting, generally it is considered to be maturing during the upward curve of the graph, and deteriorates only when the curve changes direction downwards.

Broken grains: Grain is marketed normally in whole grain form and is considered to be of inferior quality if broken. Breakage may occur from fissures as a result of excessive drying/weathering conditions in the field or during handling. Breakage reduces quality by reducing acceptability and by increasing susceptibility to infestation during storage. This affects milling yield.

Chalky or immature grain: Empty grains result from sterility and pre-harvest infections and insect attack. Immature grain content is affected by time of harvest. In rice, immature grains are greenish in colour. Thin white (usually opaque) grains are caused by incomplete grain filling and may result from pests or disease. Chalkiness is caused by incompletely filled starchy endosperm which disrupts light transmission, causing opaque regions. In most cereals, chalky areas have lower mechanical strength on crush tests and may break during handling. The broken portion is more easily invaded by certain storage pests.

Foreign matter: Dilution of the prime product by foreign matter reduces the value, and also may affect handling and processing. Foreign matter may be animal origin - vegetable origin - mineral origin.

Infested, infected grain: Grain mass, and therefore yield, is reduced by infestation. Contamination not only has direct food hygiene implications but also indirect ones, as invading micro-organisms may produce toxins under certain conditions which may lead to acute or chronic illness.

Mixed varieties: A mixture is an indication of poor pre- and post-harvest management and supervision, e.g. seed selection, lot segregation and treatment, contamination, etc. Grains differing in size and other characteristics affect processing potential. Whilst preference for a particular variety may be influential nationally or regionally, internationally-traded grain is recognised usually by grain type rather than by variety e.g. yellow or white maize. Exceptions do occur, e.g. basmati rice, (due to its aroma).

Moisture content: Moisture content of grain plays a crucial role in post-harvest processing and is associated with most of the induced characteristics. Water vapour will diffuse throughout a bulk of grain and the moisture content will tend to equalise. 'Hot spots' may occur at a site of increased respiration (caused by sprouting, infestation or microbial activity), and condensation may occur on cold grain or containers