Conclusions and Recommendations

The Conference on “Packaging for Safety of Foods” was organized jointly by the Ministry of Food Processing Industries and International Life Sciences Institute-India in association with APEDA and IIP on 25th May at Hotel Sun N Sand in Pune. The Conference was attended by 80 participants from industry, academia and government departments. The Conclusions and Recommendations of the Conference are given below.

Preamble

Food processing and food Packaging go hand in hand. The food that is processed has to be transported and distributed before it actually reaches the consumer.

The demand for food packaging is increasing rapidly because distances between food producers and food processors and between food processors and food consumers have significantly increased. Further, with nuclear families, consumer packs have become smaller in size and, with both parents in the family working, demand for convenience foods has hugely expanded necessitating a variety of packaging for a variety of foods.

Special Characteristics of Food Packaging

Food packaging is special for a variety of reasons:

- First packaging has to act as a physical barrier to protect food from contamination and waste. That also means that packing material itself should not be a contaminant.

- Second, packing must preserve the nutrition value of food by preventing interaction with oxygen, carbon dioxide and moisture.

- Third, it is desirable that packing prolongs the shelf life of foods

- Fourth, packaging can be used to change environment inside the pack and thereby delay the ripening of fruits or spoilage of vegetables.
• Fifth, the package should give information and instructions as prescribed by Government regulation

**Bulk Packaging**

The bulk/transport packages are principally made from wood, paper, metal, plastics and natural fibers like jute. They must:

• provide protection against external climatic conditions
• should be able to be efficiently filled, closed and transported
• should be inexpensive
• should be readily disposable, re-usable or have after-use

Bulk packs can be rigid like metal drums, plastic drum, crates, etc. or semi rigid and flexible packs. Packaging can be aseptic bulk packaging or molded vacuum packs

**Consumer Packs**

Primary packaging should be a good barrier against moisture, oxygen and carbon dioxide. The best options are mono layer and multilayer materials based on polyolefins nylon, aluminum foils, metalized polymers, and high performance multilayered materials having wide seal temperature, machinebility, mechanical strength, and printability, resistance to infestation, and should be food grade.

For safety of food products virgin material of international food standard, like Codex, is necessary. There are however materials which can be re-used or reprocessed for further use.

Flexible pouches are the most common form of packaging. They have a number of advantages over other packaging materials. They are cheaper, flexible, easy to transport, can be rapidly heated or cooled, retain taste, are recyclable and eco friendly.
**Major foods preservation technologies:**

<table>
<thead>
<tr>
<th>Objective</th>
<th>Factor</th>
<th>Preservation method</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reduction or cessation of microbial growth</strong></td>
<td>Reduced temperature</td>
<td>Chill storage</td>
</tr>
<tr>
<td></td>
<td>Reduced aw/raised osmolarity</td>
<td>Freezing and frozen storage</td>
</tr>
<tr>
<td></td>
<td>Nutrient restriction</td>
<td>Drying and freeze-drying</td>
</tr>
<tr>
<td></td>
<td>Decreased oxygen</td>
<td>Curing and salting</td>
</tr>
<tr>
<td></td>
<td>Increased carbon dioxide</td>
<td>Conserving with added sugars</td>
</tr>
<tr>
<td></td>
<td>Acidification</td>
<td>Compartmentalization of aqueous phases in water-in-oil emulsions</td>
</tr>
<tr>
<td></td>
<td>Alcoholic fermentation</td>
<td>Heating</td>
</tr>
<tr>
<td></td>
<td>Use of preservatives</td>
<td>Ionizing radiation</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Decontamination</td>
</tr>
<tr>
<td><strong>Inactivation of microorganisms</strong></td>
<td>Heating</td>
<td>Pasteurization</td>
</tr>
<tr>
<td></td>
<td>Ionizing radiation</td>
<td>Sterilization</td>
</tr>
<tr>
<td></td>
<td>Decontamination</td>
<td>Fumigation</td>
</tr>
<tr>
<td><strong>Restriction of access of microorganisms to food</strong></td>
<td>Packaging and storage, etc</td>
<td>Aseptic processing and packaging, etc</td>
</tr>
</tbody>
</table>

**Source:** Paper on Packaging presented by Dr P Dasgupta, Head, Packaging Development, Hindustan Lever Ltd. at ILSI-India Conference on Packaging for Safety of Foods, Pune

**Active Packaging**

Active packaging not only provides barrier to outside environment but also controls and reacts to changes taking place inside the package. It senses environmental changes and responds by changing the properties.

Active packaging is particularly useful for packaging of fruits and vegetables. It can be particularly relevant in the export packaging of bananas, mangoes, cauliflower and peas of which we are the largest producers in the world.

**Weights & Measures**

The objective of the legislation is to regulate trade in pre-packed commodities, ensure information about the commodities in the packages as also the availability of correct quantity.

Declaration has to be made on every package about the weight subject to a margin of error. Specified commodities have to be packed in standard sizes and the display panel should be of certain area, etc.

**Labels**
One of the purposes of labeling is to inform the consumer about the nutrition attributes of the food contained in the package. The label should be truthful and should not mislead the consumer.

Nutrition labeling is mandatory under Codex guidelines only when nutrition claims are made. This practice should be followed in India as well.

Government should evolve a standardized simple format to assist consumers initially in using food labels for appropriate food choice.

**Recycling of PET Bottles for Food Contact Applications**

PET bottles are collected from consumers in many countries around the world such as USA and Europe for recycling and are used for both food and non-food applications. Recycled plastics have been safely used since 1991 in direct food contact applications. Efforts should be made in the country to encourage the use of recycled PET bottles for food contact applications.