



**FACULTY OF AGRICULTURE SCIENCES AND ALLIED
INDUSTRIES**

Unit I

For

B.Sc. Ag (Third Year)



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Lecture 13. UNIT LAYOUT-SELECTION OF SITE AND PRECAUTIONS FOR HYGIENIC CONDITIONS OF THE UNIT

Availability of raw materials

Raw material is of primary importance. It should be of very high quality. The price of the raw material is one of the main factors which affect the cost of the finished products. In India, the price of fruits and vegetables is quite high in the beginning of the season but there is a glut when plenty of raw material of excellent quality can be purchased at low cost.

Site and building

The site of the plant dealing with fruits and vegetables should be near the growing area to ensure the ready availability of freshly picked raw materials and to minimize the time taken for its transport.

The site should have adequate water supply and enough space should be available so that there is no congestion and there is scope for further expansion of the plant. Sites having factories nearby which emits fumes that contaminate the air are not suitable.

After selecting the site the question of the type of building is to be considered. Existing old buildings are not suitable. The building should be designed for Indian conditions. Single-storied structures based on the requirement of working space, cost of the land, etc., are preferable as all equipments heavy machinery can be erected without difficulty and can be shifted easily whenever necessary. Ventilation and lighting are also better in single-storied buildings. Generally fruit and vegetable processing units are single-storied. The division of space should be done according to the steps of the process.

Receiving and storage section

The area will depend on the nature of the raw materials. The receiving area should be as near to rail and road as possible specially where perishable products are concerned.

Preparation section

The preparation section of fruit and vegetable processing plant requires a greater area. It should be well sanitized so that the risk of spoilage is reduced. The section should be fitted with water and steam lines such that the spreading of hoses while washing is avoided. As far as possible floors should be (a) resistant to chemicals, (b) resistant to wear (c) slip-proof, and d) have proper slope with clean and well-placed drains. The area can also be subdivided into different compartments for washing, peeling or shelling, extraction of juice, etc.

Filling, exhausting, sealing and processing section: care should be taken to control the humidity in this section where process like exhausting and sterilizing operations are mainly carried out. The floor should be quite sturdy to withstand heavy wear and tear.

Finishing section

This section where incubation, lacquering, labeling and packing are done should be scrupulously clean, cool and dry with good ventilation.

Laboratory

Although a laboratory is expensive to set-up it is a very important unit in a fruit and vegetable processing plant. Its functions are: (a) examination of raw materials (b) control of processes (c) quality control of finished products (d) introduction of new processes and better products and (e) development of new techniques.

Apart from these sections, there should be suitable arrangement for storing, keeping machinery and other equipment and disposal of waste.

Water supply

Water plays an important role in the food industry. It is used in substantial quantities for (a) cleaning of equipment, floors, walls, etc., (b) washing and preparation of raw materials, (c) preparation of brine, syrups, etc., (d) blanching, (e) cooling of processed cans, and (f) steam generation, etc.

The water should be free from contamination. If necessary, it should be chlorinated.

Disposal of waste

A large quantity of waste is produced by a cannery, containing a high percentage of solid matter, such as skins, peels and colloidal starchy material. Hence the cannery should be situated at such a place where waste could also be profitably utilized to make by-products.

Transport facilities

It is essential that the cannery should be situated near a road which connects it important towns in that area.

SANITARY REQUIREMENTS OF A FACTORY OF FRUIT PRODUCTS

- The Premises - adequately lighted, ventilated & cleaned by white washing/color washing or oil painting.
- Windows & all openings shall be well screened with wire-mesh & the doors fitted with automatic closing springs, roof shall be permanent, floor cemented.
- The equipments and the factory l not be used for manufacture of repugnant products like fish, meat, eggs etc.
- The premises - located in a sanitary place with open surroundings, preferably in industrial area/estates. Communicated not directly with residence.

- Adequate arrangements for cleaning equipments, machinery, containers tables and raw materials shall be provided. Copper, brass or iron equipments, containers or vessels are not permitted.
- The water used shall be potable.
- Adequate drainage system and provisions for disposal of refuse shall be made.
- Sufficient number of latrine & urinals shall be provided for workers.
- Wherever cooking is done on open fire, proper outlets for smoke/steam etc. like chimney, exhaust fan etc. shall be provided.
- The workers engaged in the factory shall be healthy and shall be medically examined, inoculated and vaccinated whenever required.
- The workers shall be provided with aprons, head-wears gloves etc. and shall be personally neat and tidy.

Satisfactory hygienic conditions are also maintained during processing, in order to protect the product from bacterial contamination. For the routine bacteriological control of the plant or factory, counts on utensils, equipment, working surfaces, walls and floors are regularly carried out and the results tabulated or recorded on charts to give an immediate indication of any change. The counts are used as a check on the sanitary conditions of the plant. If the sanitary conditions of manufacture are to be passed as being “good”, the general bacterial counts must be low. In addition, periodic inspection of the plant is made by a trained inspector to make sure that adequate hygiene standards are maintained.