Food processing

Food processing is the set of methods and techniques used to transform raw ingredients into food or to transform food into other forms for consumption by humans or animals either in the home or by the food processing industry. Food processing typically takes clean, harvested crops or butchered animal products and uses these to produce attractive, marketable and often long shelf-life food products. Similar processes are used to produce animal feed.

Benefits and drawbacks

Benefits

Benefits of food processing include toxin removal, preservation, easing marketing and distribution tasks, and increasing food consistency. In addition, it increases seasonal availability of many foods, enables transportation of delicate perishable foods across long distances and makes many kinds of foods safe to eat by de-activating spoilage and pathogenic microorganisms. Modern supermarkets would not exist without modern food processing techniques, long voyages would not be possible and military campaigns would be significantly more difficult and costly to execute.

Processed foods are usually less susceptible to early spoilage than fresh foods and are more appropriate for long distance transportation from the source to the consumer. When they were first introduced, some processed foods helped to alleviate food shortages and improved the overall nutrition of populations as it made many new foods available to the masses.

Processing can also reduce the incidence of food borne disease. Fresh materials, such as fresh produce and raw meats, are more likely to harbour pathogenic micro-organisms (e.g. Salmonella) capable of causing serious illnesses.

The act of processing can often improve the taste of food significantly.

Mass production of food is much cheaper overall than individual production of meals from raw ingredients. Therefore, manufacturers and suppliers of processed food products may make a large profit. Individuals may see a benefit in convenience. However, there is little financial cost in using processed food as compared to home preparation.

The food industry offers products that fulfill many different needs: From peeled potatoes that only have to be boiled at home to fully prepared ready meals that can be heated up in the microwave oven within a few minutes.

Modern food processing also improves the quality of life for people with allergies, diabetics, and other people who cannot consume some common food elements. Food processing can also add extra nutrients such as vitamins.

Drawbacks

Any processing of food can have slight effects on its nutritional density. Vitamin C, for example, is destroyed by heat and therefore canned fruits have a lower content of vitamin C than fresh ones. A USDA study in 2004, created a nutrient retention table for several foods. The table
indicates that, in the majority of foods, processing reduces nutrients by a minimal amount. On average any given nutrient may be reduced by as little as 5%-20%.

Another safety concern in food processing is the use of food additives. The health risks of any additives will vary greatly from person to person, for example, sugar as an additive would be detrimental to those with diabetes. In the European Union, only food additives (e.g., sweeteners, preservatives, stabilizers) that have been approved as safe for human consumption by the European Food Safety Authority (EFSA) are allowed, at specified levels, for use in food products. Approved additives receive an E number (E for Europe), which gives information about food additives in the list of ingredients across the different languages of the EU.

Food processing is typically a mechanical process that utilizes large mixing, grinding, chopping and emulsifying equipment in the production process. These processes by nature involve a number of contamination risks. As a mixing bowl or grinder is used over time the food contact parts will tend to fail and fracture. This type of failure will introduce small to large metal contaminants. Further processing of these metal fragments will result in downstream equipment failure and the risk of ingestion by the consumer.

Food manufactures utilize industrial metal detectors to detect and reject automatically any metal fragment. Large food processors will utilize many metal detectors within the processing stream to make sure that little damage will be caused to the processing machinery as well as reduce the risk for the consumer.

Performance parameters for food processing

When designing processes for the food industry the following performance parameters may be taken into account:

- **Hygiene**, e.g. measured by “number of micro-organisms per ml of finished product”
- **Energy efficiency**, e.g. measured by “ton of steam per ton of sugar produced”
- **Minimization of waste**, measured e.g. by “percentage of peeling loss during the peeling of potatoes”
- **Labour**, used, measured e.g. by “number of working hours per ton of finished product”
- **Minimization of cleaning stops** measured e.g. by “number of hours between cleaning stops”

*The first industrial level metal detector pioneered by Goring Kerr was introduced back in 1947 for Mars Incorporated*
A. READING COMPREHENSION

Answer the following questions according to the text. To the True or False statements correct the false statement.

1. What is food processing? (I 1-2)
2. Where can food processing take place? (2-3)
3. What kind of materials does food processing use? (3-4)
4. What is more likely to carry pathogenic microorganisms?
5. Processing does not improve the taste of food. True or False?
6. Fresh foods are more appropriate for long-distance transportation. True or False?
7. Preparing our meals at home from fresh products is cheaper than buying ready made meals from mass production. True or False?
8. Which is more likely to carry pathogenic microorganisms?
9. Processing does not improve the taste of food. True or False?
10. Fresh foods are more appropriate for long-distance transportation. True or False?
11. Preparing our meals at home from fresh products is cheaper than buying ready made meals from mass production. True or False?
12. Which is more likely to carry pathogenic microorganisms?
13. Processing does not improve the taste of food. True or False?
14. Fresh foods are more appropriate for long-distance transportation. True or False?
15. Preparing our meals at home from fresh products is cheaper than buying ready made meals from mass production. True or False?
16. Which is more likely to carry pathogenic microorganisms?
17. Processing does not improve the taste of food. True or False?
18. Fresh foods are more appropriate for long-distance transportation. True or False?
19. Preparing our meals at home from fresh products is cheaper than buying ready made meals from mass production. True or False?
20. Which is more likely to carry pathogenic microorganisms?

B. IN OTHER WORDS...

Express the following phrases in a different way (for example use synonyms or different syntax).
The underlined part has to be changed.

Example: made new foods available to the masses (line 15)

• A large number of people could buy/get/pursue new foods (now)
• Made new foods easy for a large number of people to buy/get/....

1. Long shelf-life food products (line 4)
2. Delicate perishable foods (line 8)
3. De-activating spoilage and pathogenic organisms (line 9)
4. Processed foods are less susceptible to early spoilage than fresh foods (line 15)
5. Minimization of cleaning stops(line 60)

C. WRITING

Give a brief account of the benefits of food processing.
D. FOR THE FOLLOWING EXERCISES YOU MAY NEED TO USE A DICTIONARY OR LOOK UP THE GRAMMAR REVIEW PART 1 NOTES.

1. Provide the derivatives of the following words.

<table>
<thead>
<tr>
<th>VERB</th>
<th>NOUN</th>
<th>ADJECTIVE</th>
<th>ADVERB</th>
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<tr>
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<td>2</td>
<td>financial</td>
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<td>3 consume</td>
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<td>nutritional</td>
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</tbody>
</table>

2. Derive the noun of the following verbs.

| 1   | transform        | 10  | boil       |
| 2   | include          | 11  | heat       |
| 3   | increase         | 12  | vary       |
| 4   | exist            | 13  | utilize    |
| 5   | introduce        | 14  | fail       |
| 6   | alleviate        | 15  | fracture   |
| 7   | improve          | 16  | involve    |
| 8   | reduce           | 17  | result     |
| 9   | fulfill          | 18  | reject     |

3. Derive adjectives from the following nouns

| 1   | industry        | 1   | diabetes  |
| 2   | consistency     | 2   | nature    |
| 3   | mass            | 3   | hygiene   |
| 4   | convenience     | 4   | efficiency|
| 5   | element         | 5   | profit    |
| 6   | effect          | 6   | allergy   |
| 7   | density         | 7   | availability |
GLOSSARY

1. **processing**: The act of converting material from one form into another desired form. (food) processing: μετατομή τροφίμων
2. **ingredients**: the substances present in a mixture; food items that are used for cooking a particular dish.
3. **shelf-lives**: the length of time that food may be stored and still be good to eat.
4. **harvested**: the ripe crop (fruits, vegetables etc.) that have been gathered.
5. **crops**: plants or plant products that are grown by farmers.
6. **preservation**: methods or techniques used to prevent (food) from decaying.
7. **distribution**: The process by which commodities (goods) get to final consumers, supermarkets, stores etc.
8. **consistency**: the degree of viscosity of food; the property of holding together and retaining its shape remaining unchanged to the end.
9. **availability**: when sthg is present or ready for use.
10. **perishable (foods)**: food that does not keep for long. (φθαρτά εδώδιμα είδη) perishable(adj): φθαρτός.
11. **spoilage**: a condition when food becomes bad, sour or rancid; decay.
12. **(be) susceptible to**: the condition of having extra sensitivity to diseases.
13. **alleviate (v) [+ obj]**: to reduce the pain or trouble of (something): to make (something) less painful, difficult, or severe.
14. **shortage**: not enough, not sufficient.
15. **food borne**: disease transmitted through food.
16. **convenience**: anything that makes for an easier life.
17. **peeled**: sthg from which the outer skin has been removed.
18. **element (chemistry)**: the simplest chemical substance.
19. **nutrients**: a substance that provides nourishment.
20. **effects**: the result of an action.
21. **density**: The mass of a substance per unit volume (πυκνότητα).
22. **canned**: food that is conserved in metal/tin containers.
23. **content**: the part of sth which consists of; the substance or mass of sthg.
24. **retention**: the tendency or condition of keeping or maintaining (κατακράτηση).
25. **minimal**: The smallest possible amount, quantity, or degree.
26. **On average**: Usually, typically; as a rule.
27. **additives**: Substances mixed in small quantities with another product to modify its chemical or physical state. -πρόσθετα.
28. **sweeteners**: food additives that sweeten, especially an artificial substitute for sugar-γλυκαντικό.
29. **preservatives**: A chemical added to foodstuffs to prevent oxidation, fermentation or other deterioration, usually by inhibiting the growth of bacteria.-συντηρητικά.
30. **stabilizers**: substances added to something in order to stabilize it (σταθεροποιητές).
31. **consumption**: to eat or drink (something).
32. **grinding**: The action of smashing or crushing into small particles or to powder form.
33. **chopping**: cutting into small pieces.
34. **emulsifying**: γαλακτωματοποίηση.
35. **contamination**: To introduce impurities or foreign matter; to soil or defile. Μόλυνση.
fracture: to break, or cause something to break
product stream
downstream
failure: termination of the ability of an item to perform its required function, breakdown.
ingestion to take (something, such as food) into your body: to swallow (something)
detector: A mechanical, electrical, or chemical device that automatically identifies and records or registers a stimulus
performance: manner or quality of functioning; for ex. a machine’s performance
take into account: think; consider
efficiency: effectiveness, competence; doing the job successfully and quickly
waste: Unwanted or undesired material, usually discarded.
labour: 1. Toil, to work 2. The workforce generally 3. The number of people needed for a job
produce (n) Harvested agricultural goods collectively, especially vegetables and fruit.
harbor: To provide a harbor or safe place for sthg (εγκωλπίζω- μεταφορική χρήση)
indicate: To show or manifest by symptoms; to point out; to discover;