Definitions:

- **Nutritionally Modified Foods**: Foods that have been changed to improve their nutritional qualities, either by adding some component (such as; vitamins, minerals, fibre, active non-nutrients) or by removing or reducing some component (such as; sugar, fat, sodium).

- **Functional Foods**: Foods that surpass the basic nutrients (the macronutrients and micronutrients) found in foods that have proven health benefits.

- **Fortified Foods**: Foods whose nutritional content has been increased by the addition of more of the vitamins and minerals they already contain.

There are a variety of functional foods that are available on the market. They are designed to meet the demands of consumers who want to prevent or control diet-related disorders. Many modified foods feature nutrition claims on their food labels so they can be marketed as health-enhancing, but the actual terms used are regulated by Food Standards Australia and New Zealand (FSANZ).

**Nutritional modification can occur during:**

- The primary production of the food, e.g: low- fat meats such as lean pork can be bred in the Agriculture and Fisheries sector.
- The processing of the food, e.g: Fat free milk is produced during the Food Processing and Manufacturing sector.
- Preparation for retail sale, e.g: protein powder can be added to fresh fruit juice in the Food Service and Catering sector.
<table>
<thead>
<tr>
<th>Health Concerns</th>
<th>Suitable Modified Foods</th>
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| Obesity          | ● Low-fat foods, e.g: milks  
                  | ● Low-carbohydrate foods, e.g: beer  
                  | ● Reduced-fat foods, e.g: cheese  
                  | ● Diet foods (low-kilojoule), e.g: soft drink                                           |
| Heart Disease    | ● Low-fat foods, e.g: yoghurt  
                  | ● Salt-reduced foods, e.g: tinned soups  
                  | ● Added antioxidant foods, e.g: margarine with Omega 3                                  |
| Osteoporosis     | ● Calcium fortification, e.g: orange juice with calcium                                  |
| Anaemia          | ● Iron fortification, e.g: iron-enriched breads, orange juice with added iron           |
| Diabetes         | ● Diet foods, e.g: diet jelly  
                  | ● Low-sugar foods, e.g: soft drinks                                                    |
| Hypertension     | ● Salt-reduced foods, e.g: cheese                                                      |
| Food Intolerance | ● Gluten-free foods, e.g: pasta, biscuits  
                  | ● Lactose-free foods, e.g: milk                                                       |
| Vegetarians      | ● Soy based sausages                                                                  |
Active Non-Nutrient Components of Functional Foods

- **Functional Foods**: Foods that surpass the basic nutrients (the macronutrients and micronutrients) found in foods that have proven health benefits.

There has been an increase in consumer interest in health and an increasing demand for foods that meet nutritional needs. The most modifications that food manufacturers make to products is; reduced energy, reduced fat and reduced salt foods. Manufacturers also increase fibre, vitamins or minerals (such as folate).

**Food Examples of Functional Foods:**

*What are Active Non Nutrients:*

**Active non nutrients**: Substances that are not necessarily essential in the diet, but can enhance the functioning of the body or contribute to the promotion of good health.

For example; fibre can help keep the gut healthy by providing fuel for beneficial bacteria, and by stimulating the muscle contractions (peristalsis) that keep the gut contents moving effectively.

*Types of Active Non-Nutrients:*
1. **Phytochemicals:** beneficial substances found naturally in plants. Examples include anti-oxidants and phyto-oestrogens.

   **Antioxidants:** Antioxidants are chemicals that stop oxidation and prevent oxidative damage in the body. There are at least 8000 different anti-oxidants that occur naturally in fruits, vegetables and other plant sources.

   - **Flavonoids:** Chemicals that contribute to the red, purple, blue and pale yellow colours of fruits and vegetables.
   - **Carotenoids:** Chemicals that contribute to yellow, orange and some red colours of fruits and vegetables. Lycopene is a dark red carotenoid found naturally in tomatoes. It is believed to protect against prostate and breast cancer.

   Of all the anti-oxidants, vitamin E seems to be the most involved in controlling blood cholesterol levels.

   Taking anti-oxidants in supplement form does not have the same beneficial effect as eating them in food. This may be due to the fact that the anti-oxidants work together in the body as a whole system, and foods provide multiple parts of the system in the right amounts, while supplements do not.

   **Phyto-oestrogens:** These are substances that are converted, by bacteria in the gut, into hormone-like compounds which can imitate the hormone oestrogen. These can reduce menopausal symptoms such as hot flushes, reduce breast & prostate cancer, as well as improve cardiovascular health.

   - **Isoflavonoids:** Found in fruits, vegetables, seeds, nuts and legumes. Soya beans being the best source.
   - **Lignans:** Found in grains and seeds. Linseeds being the best source.

2. **Dietary Fibre:** It is not considered a nutrient, but does help to keep your gut working well. Fibre is found in plant foods and indigestible carbohydrates that absorb moisture in the gut, swelling to create a larger and softer faecal mass. This makes the faeces easier to pass and keeps the gut contents moving. This means that the gut contents move through the body more quickly, reducing the time that any toxins are in contact with gut cells. This may reduce cell damage and protect against some cancers.
Soluble Fibre: Is dissolved in the gut and creates a feeling of fullness.
Insoluble Fibre: The type often called ‘roughage’ that remains mostly unchanged.

Many breads and cereals have high fibre alternatives available where fibre has been added to increase the fibre content.

Food Example:

3. Omega-3 Fatty Acids: Omega-3 fatty acids can be converted to hormone-like substances called prostaglandins that are involved with the correct functioning of the cardiovascular system as well as brain functioning. Fish, fish oils, canola oil, soyabean, linseed and flaxseed oils are good sources.

4. Probiotics: Probiotics are another name for ‘beneficial bacteria’. The human gut contains billions of bacteria. Some bacteria are harmful and can cause illness, however, a balance of good bacteria can prevent disease. Gut infections, surgery, a poor diet and certain medications (such as antibiotics) can reduce the numbers of health gut flora (the bacteria that live in the gut), and probiotic foods are often used in these situations to increase them again. Yoghurt contains lactic acid and is a good probiotic.

Food Example:
**Modified Processed Foods**

**Fortified Foods**

- **Fortified Foods:** Foods whose nutritional content has been increased by the addition of more of the vitamins and minerals they already contain.

Some common fortified foods are breads, cereals and milk, which may contain for example; added folic acid, calcium, iron or fibre.

**Voluntary Fortification:** Means manufacturers can decide to fortify their products with any vitamin or mineral, providing they follow rules set out by FSANZ. E.g: High fibre bread.

**Mandatory Fortification:** Certain products have been identified by the government as foods that should always be fortified in a certain way. So every manufacturer of these items must, by law, fortify that food to a specific level. Example; because a public health need for vitamin D has been identified, all margarines must be fortified with vitamin D. Similarly, all wheat flours used for bread must be fortified with thiamine and folic acid.

<table>
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<tr>
<th>Pros</th>
<th>Cons</th>
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<td>Fortifying foods is a good way to introduce into a person’s diet valuable nutrients they may otherwise lack.</td>
<td>Escalated levels of certain vitamins and minerals can have a negative effect on a person’s health, causing illness.</td>
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**Food Example:**