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Why The Role of Food Science is Important in Human Nutrition?

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Introduction

Food science is the scientific study of food from farm to plate, as it starts from the period of harvesting, processing, storage, packaging, and manufacturing. Food science is defined as the application of science and engineering to study the physicochemical and biochemical nature of food and food processing principles. Food science allows us to make the best use of our food resources and minimize waste (Miller DD, Welch RM). As human nutrition and food science, both are concerned with food, it shows that they are interconnected. Food science broadens our horizon on the food we consume so it plays an important role in human nutrition. The role of food science in human nutrition includes – food processing, food fortification and enrichment with nutrients not present in food or lost during the processing, and also preservation and storage of food. Food is something that provides nutrients. Nutrients are substances that provide: energy, growth, all functions of the body (breathing, digestion, and healthy immune system) (Norman N. Potter, 2007). Food is virtually derived from living cells. Thus, foods are composed of edible biochemical and we need to understand their chemical effects and biochemistry.

Nutrition transition includes a change of composition from traditional to modern diets that have increased sedentary behaviour. Nutritional science is a connection between diet and health. Human nutrition is linked with economics and political science as the world community recognizes and responds to suffering and deaths caused by malnutrition (Lutsey PL, 2008). The utilization of food materials by all living organisms is described in nutrition, and biochemical processes are metabolism.

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Utilization of food by the body

We can say that the human body is an engine that needs fuel in form of food that is digested and gives energy. And this energy is utilized by work performed by muscles and is necessary for the maintenance of body structure and functions. The human body is catabolizing and anabolizing its component parts (Norman N. Potter, 2007). Food supply nutrients essential to produce new material and provide the energy needed for the chemical reactions occurring in the body. The energy present in food can be calculated directly by measuring the heat produced when the food is burned (oxidized) in a bomb calorimeter. The energy-yielding nutrients are as follows: carbohydrate- 4 kilocalories per gram, protein- 4 kilocalories per gram and fat- 9 kilocalories per gram. In a prosperous society approx. 12-15% of energy is derived from protein, 30-40% from fat and 50-60% from carbohydrates (Lutsey PL, 2008).

Recommended daily intake (recommended dietary allowance or adequate intake)

(national academy of sciences)

Macronutrients	**Women**	**Men**
Carbohydrates	130 g	130 g
Fiber	25 g	38 g
Linoleic acid	12 g	17 g
Alpha-Linoleic acid	1.1 g	1.6 g
Protein	46 g	56 g
Vitamins		
Vitamin A	700 ug	900 ug
Vitamin C	75 mg	90 mg
Vitamin D	5-15 ug	5-15 ug
Vitamin E	15 mg	15 mg
Vitamin K	90 ug	120 ug
Minerals		
Calcium	1000-1200 mg	1000-1200mg
Magnesium	310-320 mg	400-420 mg
Phosphorus	700 mg	700 mg

Essential nutrients

The importance of food as a source of macro and micronutrients depends not only on the nutrient present in a food product but also on the per cent of food consumed. The food is consumed in which form as raw, cooked or processed also influence the nutritional

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importance. Essential nutrients are defined as the chemical substances present in food that cannot be synthesized or insufficient amounts in the body and are important for life, growth and proper functioning of the body (Jim Mann, 2017). In the 1920s, Linoleic and linolenic acids were recognized as essential fatty acids and followed by determining the micro-amounts of trace elements in the foods and tissues. The trace elements are copper, manganese, zinc, selenium, fluoride and chromium (Jim Mann, 2017).

There is an additional group of food components such as dietary fibres and some carotenoids that are not essential but has importance in the maintenance of health and possibly reducing the risk of chronic disease (WHO, 2014).

Nutritional classification of foods

- **Energy yielding foods-** Foods that are rich in carbohydrates and fats. Examples – cereals, roots, tubers, sugar and fats.
- **Bodybuilding foods-** Foods rich in protein. Examples – milk, oil, meat, fish, eggs and pulses etc.
- **Protective foods –** Foods that are rich in proteins, minerals and vitamins

Classified into two groups

1. Food is rich in vitamins, minerals and protein. Examples- milk, eggs etc.
2. Food is rich in minerals and vitamins only. Examples- green leafy vegetables and fruits (J-F Meullent, 2013).

Conclusion

Human nutrition and food science are interlinked terms ass without knowing the science behind the food we cannot fulfil the daily requirements of food. Human nutrition is a process through which substances present in food are transformed into body tissues and provide energy for physical and mental work. Eating a healthy diet, sufficient sleep, avoiding smoking and keeping yourself physically fit makes bright chances of productive and healthy life in later years. There are some roles of food science in human nutrition are food fortification and enrichment in nutrients of the food. The purpose of this paper is to focus on the role of food science in human nutrition as science plays an important role in food and its composition. There is a fixed dietary allowance for each food nutrient and we should take food on that limit only.

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