

# Naturally occurring polysaccharides in foods

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# Introduction

- Polysaccharides: Consist of repeating units of monosaccharides or their derivatives held together by glycosidic linkages
- They are two types
  - ❖ Homopolysaccharides: Starch, dextrin, cellulose
  - ❖ Heteropolysaccharides: Hemicellulose, Gums, mucilages (from seaweeds like *Gelidium* sp. , *Laminaria* sp.), pectin substances

# Starch

- Starch is found in most parts of a plant as a reserve store of carbohydrates
- It is usually present in the seed and root in large amounts
- It is the important energy giving polysaccharide present in food. It is present in (1) cereals such as rice, wheat, corn, and barley, (2) legumes such as peas, beans, and lentils and (3) tubers such as potatoes, yam, and cassava. Starch imparts a moist gelatinous texture to food.
- Starch consists of long chains of glucose units present in two forms
  - Amylose
  - Amylopectin

# Cellulose

- Cellulose is the structural component of the primary cell wall of plants and different types of algae.
- It is secreted as biofilm by some bacteria.
- Higher values are found in wood (40-45%) and cotton (90%).
- A high cellulose foods includes many leafy green vegetables like sprouts and green peas, fruits, beans like mung beans

# Dextrin

- Dextrin is produced by a dextrinization process which is defined as partial hydrolysis of starch with dilute acid or by heating dry starch
- Dextrin obtained from wheat starch, corn starch, tapioca, rice

# Pectin

- Pectin is a structural polysaccharide present in the primary cell walls of terrestrial plants.
- It is present in the peels of apples, citrus and sugar beet.
- It extracted and used as gelling, thickening and stabilizing agent in confectionery (sweets), dairy (milk drinks) and fruit preparations such as jams and jellies.
- It forms a natural part of diet.
- It is a source of dietary fiber

# Natural Gums

- Natural gums are polysaccharides of natural origin, capable of increasing the viscosity of solutions even at very low concentrations.
- They are found in the seed coatings and in the woody elements. Natural gums obtained from plant sources are gum arabic, gum ghatti, gum tragacanth etc.
- while that obtained from marine sources are agar, alginic acid, sodium alginates and carageenan.
- They are used as thickening agents, gelling agent, emulsifying agents and stabilizers.

# Other types of polysaccharides present in food

Types of polysaccharides	Source	Uses
Agar	Red algae ( <i>Rhodophyceae</i> sp.)	Microbiological nutrient; gel-forming agent; Emulsifier; meat texturizer; meat substitute
Alginates	Brown algae( <i>Pheophyceae</i> )	Thickener; gel-forming agent; food and beer foam stabilizer



## Cont...

Types of polysaccharides	Source	Uses
Carrageenans	Red seaweed ( <i>Rhodophyceae</i> )	Gel-forming agent; stabilizer; protein fiber texturizer; milk fat anticoagulant; milk clarifying agent
Dextran	Frozen sugar beet	Blood substitute
Inulin	Endive, artichoke	Prebiotic

Thank you