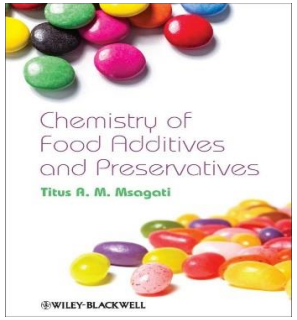
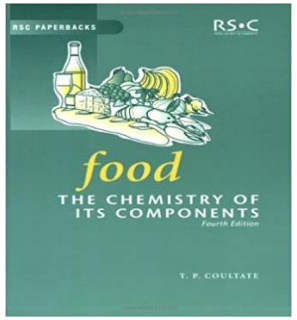
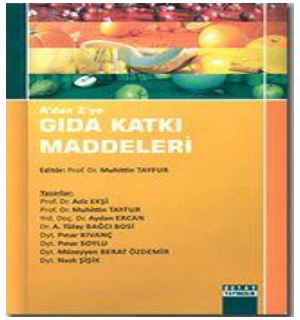
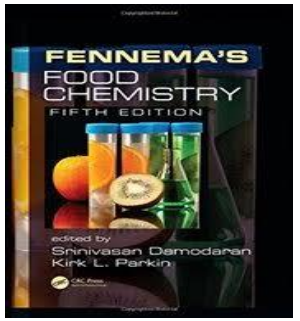
12.Week: STABILISERS, GUMS, THICKENERS AND GELLING AGENTS AS FOOD ADDITIVES

1. 

2. 

3. 

4. 

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STABILISERS, GUMS, THICKENERS AND GELLING AGENTS AS FOOD ADDITIVES

Like all other food additives, stabilisers, thickeners and gelling agents are a group of compounds which play a very important role in the food industry to improve stability, texture, viscosity and make food products firmer. They are a diverse group of compounds with different chemistries and functional groups including amino acids, polyalcohols, carboxylic acid salts, carbohydrates and some proteins. Most of these compounds are natural from either plant or animal origin.

Stabilisers in foodstuffs prevent food components from separating; they also give food a consistent texture.

Gelling agents are useful when the consistency of a particular food has to be altered to meet consumer demand.

On the other hand, ***thickeners*** play a useful role in giving food body.

Stabilisers and thickeners may be divided into **two main classes**: ***polysaccharides*** and ***proteins***.

POLYSACCHARIDES

Polysaccharides comprise **three main subclasses**:

(**1**) non-ionic (neutral), for example hydroxyethylcellulose and dextran

(**2**) anionic, for example xanthan, carrageenan, guar gum, alginate and carboxymethylcellulose

(**3**) cationic, such as arginine hydrochloride and chitosan (a linear copolymer of D-glucosamine and N-acetyl-D-glucosamine units connected through β-(1–4) linkages)

PROTEIN-BASED FOOD STABILISERS

Protein-based stabilisers such as ***soya proteins*** are normally used in foods such as burgers or sausages for vegetarians. Soya proteins in these vegetarian food preparations prevent the food from disintegration during cooking. The soya protein will tend to gel the whole product, thus keeping it together.

Food stabilisers play an important role in maintaining the integrity of foods in terms of physical and textural attributes, especially during heat treatment of foods, transport or storage.

Thickeners are responsible for altering the texture of foods while gelling agents impart the desired shape and structure.

Gelatin is a product of the structural and chemical degradation of collagen derived from animal skin and bones.

QUALITY CONTROL OF FOOD STABILISERS AND THICKENERS

Quality control of foods stabilisers is normally carried out by assessing rheological measurements (i.e. investigating the flow tendencies of matter in their liquid state). The flow behaviour can also be studied in non-liquid state (e.g. solid state or semi-solid state), where plasticity rather than deformation properties of the stabilisers in response to the force being applied can be assessed and characterised.

The rheological qualities of hydrocolloids in solution are governed by a number of factors such as the amount of the active compound, dissolution, temperature and extent of dispersion.

ANALYTICAL METHODS

Analysis of most additives incorporated in foods as stabilisers, thickeners or gelling agents is always a challenge. This is due to a number of factors, including the fact that most of these agents (e.g. the polysaccharide hydrocolloids) are applied in food matrices at minute quantities. In addition to this, the food matrices also contain other polysaccharide molecules which are quite similar in terms of their chemistry to the stabiliser polysaccharide hydrocolloids. The analytical regimes for stabilisers and thickeners in foodstuffs is also complicated by the tendency to use a combination of more than one type/class of stabiliser (synergy).