Modified starch

Modified starch
Modified starches have been used for many years and the term means that the properties have been adapted. Modified starch is declared on food labels in certain European countries, including the UK.
The definition for modified starch is:
"Starch which has been treated physically or chemically to modify one or more of its key physical or chemical properties."

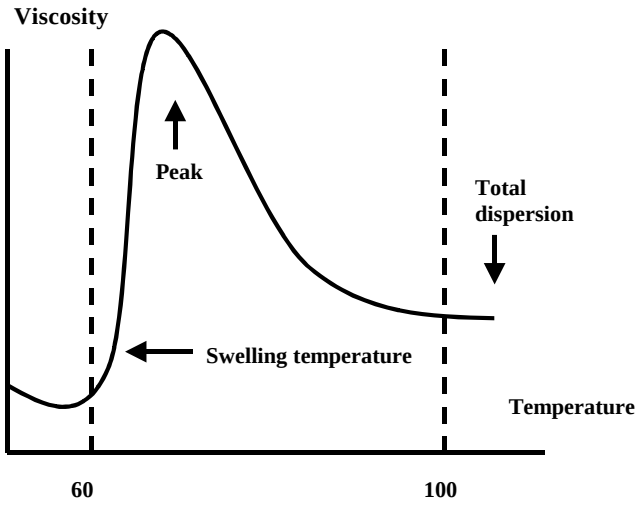
Genetically modified
The phrase "modified starch" can get confused with "**genetically modified**" food.
The term "modified starch" does not mean that the starch has been produced by genetically modified techniques.

Why are starches modified?
Starches are modified for use in the food industry in order to make them easier to use, more stable in processing and to give a wider range of textures.
Starches can be **physically** or **chemically modified.**

Modified starches can have *functional properties* used in large scale food production that native starches do not provide. For example, in puddings they can provide instant thickening and creaminess.
Modified starch can withstand large scale processing conditions better than native starches.
Modified starch has consistent properties and this helps in controlling processing and making products with a reliable quality.

Ingredients have to stand up to large scale processing

Native starches such as conrflour have a **narrow peak viscosity**. They become thick for a short time, then begin to break down. They do not stand up well to processing, and produce a low quality final product. Starches are modified to prolong maximum viscosity.



Cornflour has a narrow peak viscosity

Pregelatinised starch is used to make milk desserts and save a cooking step

Modified starch

How are starches modified?
Starches are modified in several different ways. The main processes are called

- Cross linking
- Stabilising

Cross linking improves **process tolerance**, which means the starch can withstand heating, acid ingredients, stirring, pumping and packing. This starch does not break down during cooking.
Stabilising helps the product resist retrogradation. This means the starch has good freeze/thaw stability and good stability over time.

Pregelatinised starch
Pregelatinised starch has already been cooked in water, gelatinised and then dried. It is also known as
precooked starch,
pregelled starch,
instant starch,
cold water starch
and cold water swellable starch.
When the powder is added to cold or warm liquids, it swells to form a gel and becomes viscous and does not need further heating.

Pregelatinised starches

- save a cooking step, since sauces don't need to be heated to thicken them
- are used in dry mixes such as dried soups which have liquid added to them
- are easy to use as they thicken mixtures instantly and give a reliable quality
- need a shorter processing time which can save money.

Pregelatinised starches can produce **smooth** or **pulpy** textures. The two textures are made using different drying methods.
The smooth texture is used for soups and sauces. The pulpy texture is used in fruit pie fillings and tomato toppings for pizza.

Organic

Physically modified starches are used for organic food products

Physically modified starch can be used for organic pie fillings

Physically modified starch
This starch is physically treated by the manufacturer without the use of chemicals. Starches can be physically modified by roll drying, extrusion, spray drying, and with heat and moisture treatment.

Physically modified starches do not need to be labelled as "modified starch" on the food label. They can be labelled "starch" and are used in organic products.

Questions

1. Explain why starch is modified.

2. How is starch modified?

3. What is physically modified starch?

4. How are pregelatinised starches made and what are the advantages of their use?