

Enzymes

– the **fire** in our bodies

Have you heard or seen advertisements for washing powders that claim the powders contain enzymes that can remove specific stains? Are the claims of the manufacturers true? Let's see...

Our bodies use food to give us energy. Some foods, like proteins such as gelatine and starch, need to be broken down before our bodies can use them. The units, or molecules that make up proteins and starches are large, but they again are made up of smaller units. This breaking down of the larger units into smaller ones is called digestion. Our bodies use enzymes to burn the foods (or digest them) for their energy.

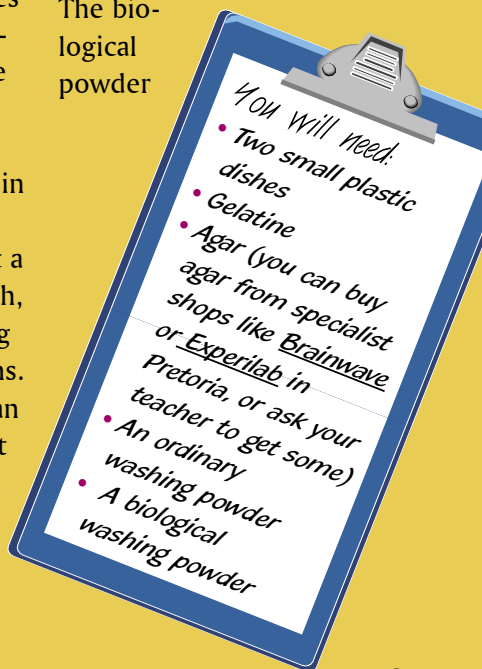
The enzymes which help in digestion are specialists. An enzyme which would digest a protein will not digest starch, nor would a starch-digesting enzyme break down proteins.

To see how an enzyme can break down proteins, and at the same time see if the claims of manufacturers of washing powders are true, try the following two experiments:

Hole in the jelly

Read the instructions on the packets carefully and prepare two dishes of clear jelly, one of gelatine, and the other of agar.

On each jelly, put a small pinch of an ordinary powder detergent, and of a so-called biological washing powder. (See the sketch on page 8). The biological powder

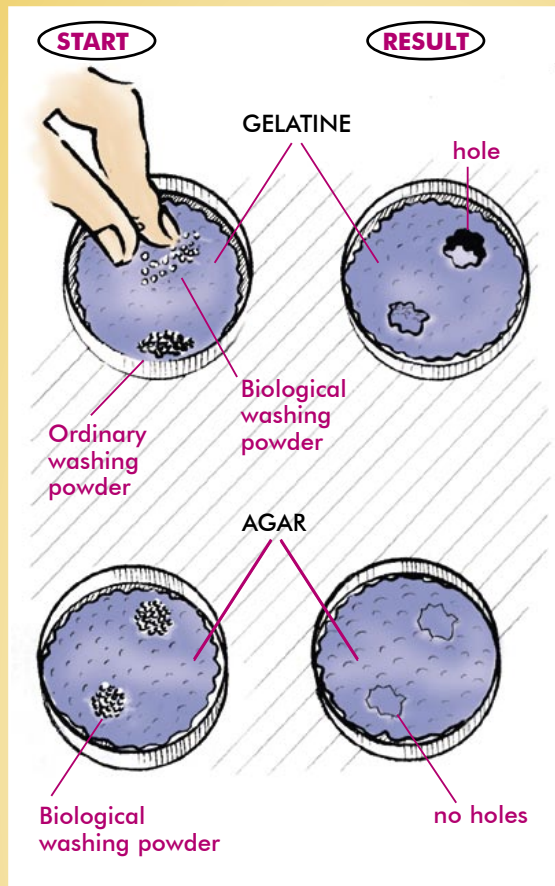


AGAR

is made in Japan from seaweed, and is used in cooking and confectionery. It can be made up into "jelly" just like gelatine.

CATALYST

Something that allows or encourages chemical reactions to take place, while it remains unchanged itself.



is supposed to contain an enzyme which 'removes difficult stains like egg, gravy and blood'. These contain proteins. If this is a true claim, we would expect to find the gelatine (a protein) dissolved away under the 'biological' washing powder, but not under the ordinary powder.

The agar (not a protein) should not be dissolved by either. The jelly might soften a little for many reasons,

but do not be misled by this. Look for a great hole in the jelly.

Try this experiment and see what you find. If there is a hole in the gelatine under the biological washing powder, but not one under the ordinary washing powder, then the claims of the manufacturer are true.

Get rid of the yolk

Boil two standard eggs together, and push two teaspoons into the yolks so that there is some yolk left on the spoons. You may now eat the rest of the eggs!

Dissolve equal amounts of ordinary and 'biological' detergents in two separate glasses of water, and leave a yolk-stained spoon in each glass. After some time you

ENZYMES

... are special catalysts in our bodies which allow changes such as a kind of burning to take place very gently.

Digestive enzymes convert food to simpler substances, but many other enzymes work in the opposite way, linking simple substances together to form the more complex ones needed to build up tissue.

Enzymes themselves are made of protein.

Enzymes work best at a particular temperature, which is one of the reasons why our bodies are kept at constant temperatures.

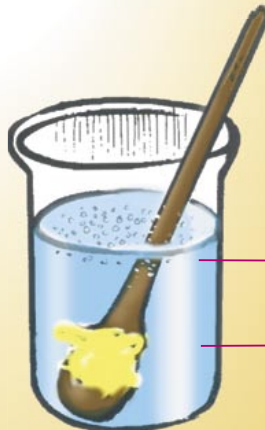
You will need:

- *Two eggs*
- *Two glasses*
- *Biological washing powder*
- *Ordinary washing powder*



Biological washing powder

No egg yolk



Ordinary washing powder

Egg yolk

will see that the spoon in the ordinary detergent still has yolk on, but the yolk on the other spoon has been digested by the 'biological' detergent. This will happen if the 'biological' detergent really contains enzymes that break down the proteins in egg yolk.