

# MAKE YOUR OWN BIOPLASTIC!

USING  
COMMON HOUSEHOLD  
INGREDIENTS

## WHAT IS BIOPLASTIC?

Bioplastic (also called organic plastic or biopolymer) is a form of plastic made using a renewable biomass source as the main ingredient, such as fermented sucrose (which is altered to form a substance called polylactide), gelatin, vegetable oil, corn starch, pea starch, or cellulose. In comparison, most plastics that are widely used today need fossil fuel (petroleum) to make the end product.

## WHY IS BIOPLASTIC BETTER?

Numerous bioplastic products have been developed around the world or are in the process of being developed. The majority originate from plant material. The plant material needed to make bioplastic can be grown continuously. In contrast, petrochemical-based polymers will eventually run out (i.e. the rate of use exceeds the time taken for petrochemicals to form).

Additionally, many bioplastic products are biodegradable which means they can easily be broken down into CO<sub>2</sub> and water by micro-organisms. Some can be put into an industrial composting process and will break down by 90% within six months. Petrochemical-based plastic in comparison can take thousands of years to break down.

It is also argued that another benefit of bioplastic products (given a lot of them stem from a plant source), is they may ultimately be carbon neutral.

## WHAT IS THE FUTURE OF BIOPLASTIC?

Many types of packaging and a whole host of plastic-based products could soon be made on a commercial scale using bioplastic. Here in Australia, the \*CRC SIIB has made remarkable progress in developing sugarcane that can produce commercially significant amounts of the bioplastic, polyhydroxybutyrate (PHB), which it stores primarily in its leaves. PHB is the key ingredient in the production of a wide array of bioplastic products.

## MAKE YOUR OWN BIOPLASTIC AT HOME

On a small scale, you can make your own bioplastic using common household ingredients. To do this, you need at least one biopolymer and one plasticiser.

**Examples of biopolymers:** **gelatin** - a protein derived from animals, **starch** - a polysaccharide derived from plants, and **agar** - a polysaccharide derived from red seaweeds.

**An example of a plasticiser** is glycerol. Glycerol is a viscous liquid and a by-product of soap production.

Agar, gelatin (sold as gelatine) and starch (eg: potato flour) can be purchased in supermarkets, and glycerol in chemists.



*\*CRC SIIB — working towards the commercial development of biomaterials to give the sugar industry a sustainable, competitive edge.*

## RECIPE

This recipe can be used to produce objects that can be cut into shapes with scissors once they are dry. Alternatively, the mix can be poured into molds.

### Ingredients

3 g (half tsp) glycerol and 12 g (4 tsp) gelatine  
60 ml (1/4 cup) hot water. For colour, add food dye as desired.

### Procedure

1. Mix together glycerol, gelatine, water and food dye.
2. Bring mix to 95°C or just below boiling, stirring continuously.
3. Reduce the temperature and continue to stir the mixture until there are no visible lumps.
4. If there is froth on top, scoop it out with a spoon and discard.
5. Carefully pour the mixture into non-stick molds and leave in a warm place to dry. Allow approximately three days to dry.

