PLASTICS & CASEIN HISTORY

Plastics are often being counted to the group of organic materials which includes steel, copper and minerals like glass, cement and ceramic. There are three groups of plastics: the natural plastics, the half synthetic plastics and the synthetic plastics.

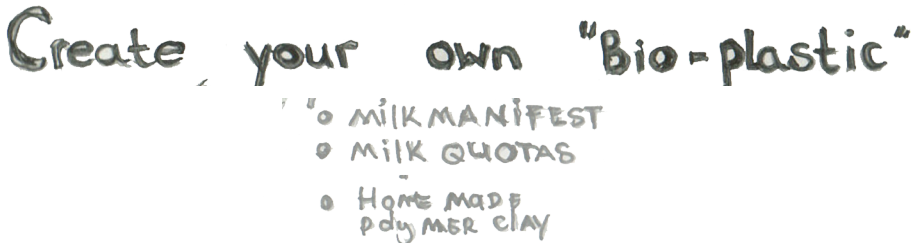
The earliest half synthetic plastics are directly derived from natural materials like cellulose and casein. Most of the plastics nowadays are synthetic and produced of oil, charcoal or gas. Besides the historical background of casein it can be used to produce natural plastics. With simple and easy accessible ingredients - as milk and vinegar – it can be used by everyone and be fabricated with kitchenware.

Casein was used in the 20th Century as a half synthetic plastic made of the proteins of milk. Around 1900 the Vereinigten Gummivarenfabriken file dan patent application and was shown as ‘Galalith’ to the public in Paris. This composition was used for small productions for objects like knots, belts and knitting needles. Thousands of years earlier the Egyptians used proteins as a fixative for pigments which they used for wall paintings.

The world wide demand for milk is evolving and therefore the number of Dutch dairy farmers as well. These positive trends come with threats, namely the so called ‘milkpool’ and ‘buttermountain’. These arose from overproduction of milk which lead to wastage of dairy products. With the forecast of possible wastage I’ve developed a recipe that offers an opportunity for the local and regional production bioplastics that can prevent the wastage of natural resources in this case milk.

The production of casein comes with a certain responsibility. If you want to use this recipe you will have to honor the Milk manifest. Research about the evolution of natural plastics sparked my belief for the potential for casein in the future. Therefore I’ve used the abolition of the ‘milk quota’ to diminish the threat that poses for our society.

Casein is a chemical reaction who is also known as polymerization and is a polymer. These are created by pressure, heat and chemical processes. When milk is heated and vinnegar is added a sort of mozzarella clay arises, because of the acidifying effect of the vinnegar. This makes the proteins precipitate which produces the casein.



THE ESSENCE OF THE CASEIN "BIOPLASTIC".

The essence of making bioplastics (casein) out of milk and vinnegar lays by the changes and developments in the Dutch milkproduction. From April 2015 the legislation for the milk production for Dutch farmers changed. Unitil April 2015 there was an limit applied on the milk production, which involved a fine when this limit was exceeded.

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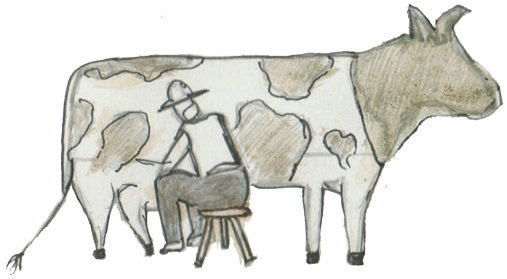
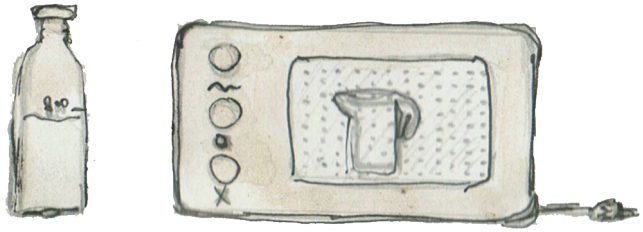


MILK MANIFEST:

- The aim is to reduce the production of synthetic plastic by stimulating the production of bioplastics.
- These bioplastics should only be produced with resources that are available locally and therefore should vary by region.
- The aim of this recipe is to function as a bridge between DIY plastic and DESIGN bioplastics and to offer the middle class an easy and affordable alternative.
- The Milk manifest believes that there is a need for a new Movement and society that investigates the possibliities to simplify the production of bioplastics.
- Everyone who uses the recipe and endorses the viewpoints of the Milk manifest avoids the use of synthetic polymers and only uses biopolymers in the production process.
- Everyone who uses the recipe is obliged to participate in the open design, which means that he or she will share among others.
- Natural resources as well as the societal and cultural context serve as the base of the recipes. Whereby solution-oriented and innovative design with respect for the past is central.
- There will be sought for a middel between industrial manufacturing and craftmanship. Both should be involved in the production process.
- Remember, we are pioneers. We have to show the mass that synthetic plastics aren’t the only option!
- The Milk manifest Movement tries to adress social problems like the abolition of the milkquota by being inspiring as a designer.
- And remember: always keep in mind what other pioneers in different Movements already achieved and strive for progress and greatness!



STEP 1:

The first step in the process is to pour the milk (400 ml) in the measuring cup.
Then put the cup in the micro wave for 7:10 minutes (800w) or heat up the milk in a pot but make sure the milk isn't boiling.

STEP 2:

Get the kitchen scale and the small bowl to weigh 18 mg vinnegar.
After finishing this pour the 18 mg of vinnegar in one of the large bowls.

STEP 3:

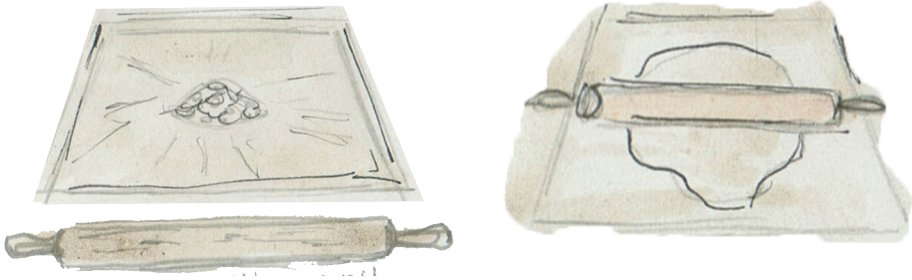
Get the milk out of the microwave when it's finished. Pour the warm milk in the large bowl, like you're pouring Turkish tea. Now let nature work it's magic and wait until it's cooled down. This is going to take approximately 15 minutes. Get a spoon and stir the mixture after 7:30 minutes. Make sure that you reach the bottom of the bowl when you're stirring so the entire mixture is stirred.

STEP 4:

After 15 minutes the mixture is cooled down and it's supposed to be an mozzeralla-ish substance. Now drain the minxture in a new bowl and let it drain for 10 more minutes.

STEP 5:

After letting the mixture (casein) drain for 10 minutes put it in a kitchen towel. This is important to prevent it to mold! Everything that isn't cooled and contains water or other fluids can mold.



STEP 6:

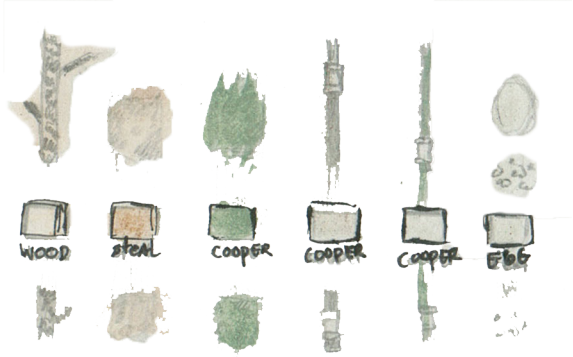
Now you've succeeded the steps to produce casein and it it time to shape it. When you when to create slices it is best to use a dough roller. The casein is still sticky so it is advisable to use baking paper or foil. When you want to use a mal you have to make sure that you surround the entire mal with baking paper. It is easy to create texture on the casein clay.

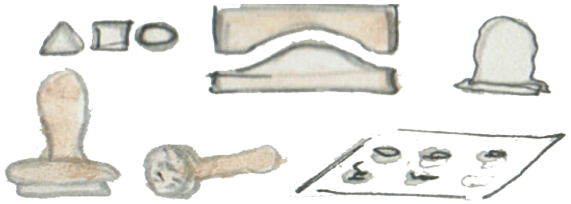
STEP 7:

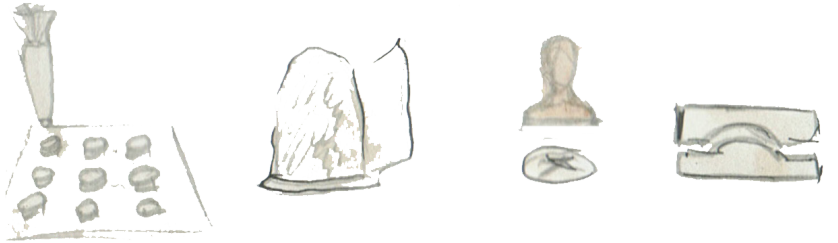
Mind the fact that the casein clay get enough air to dry up. It is advisable to let it dry outside or in a dry space. The drying process depends on the size and takes a maximum of 4 days to dry up. The casein plastic is recognizable by its white colour and hard texture.

STEP 8:

Congratulations! You have succesfully produced natural plastics. Satisfied? The plastic is now ready to be painted. This is also possible during step 3.







STEP 9:

This is a very important step and shouldn't be forgotten. Share your result and your experience on my website: www.gabylidia.com. Or the website where you found this casein recipe. By doing this we can stimulate the production of bioplastics and share the simplicity of doing with the mass!