This assignment investigates ice cream and engineering. It lists different recipes on how to make my product and answers the question ’how many engineers does it take to make an ice cream?’.

PROBLEM

I will be making a low-fat chocolate ice cream

Homemade ingredients

125ml Milk

125ml Whipping cream

1tbsp sugar

1/2tsp cocoa

Industrial ingredients

Milk (containing water) = 64%

Non-fat solids = 12%

Fats = 10%

Sugar = 13%

Flavouring (chocolate) = 0.5%

Emulsifier and stabiliser = 0.5%

containi

Why I have chosen this ice cream

Did you know that 64% of adults have a BMI of 25 or over? This is information provided from public health England, who published the data in May 2017. Therefore, I would like to create a low fat chocolate ice cream because I want to reduce that number, especially with a sweet treat. I also think that the ice cream that lots of people like is chocolate so this could attract lots of people, including children. According to the Ice Cream Alliance, the top two most popular ice cream flavours in the UK are vanilla and chocolate. While doing research I came across an article from the Verdict about a lack of vanilla beans due to a cyclone in Madagascar in March 2017 - which is one of the main producers of vanilla beans. Due to this, vanilla is going to be harder to get and more costly, which is why I feel that a chocolate ice cream would be a better option. A low-fat version will also help to tackle the obesity problems of both adults and children.

IDEAS: HOW TO MAKE (AT SCHOOL / HOME)

* The ingredients I will use are: milk, non-fat solids, fats, sugar, cocoa, emulsifier and stabiliser, salt and ice.
* I think that to make my ice cream in school or at home I will use the following method:
1. Mix everything (the flavouring, sugar, emulsifier ,stabiliser, fats, non-fat solids and milk) together in a bowl.
2. In another bowl add the ice and sprinkle the salt on it.

3. Finally, I will sit the ingredient bowl in the ice bowl and leave it to freeze into ice cream.

IDEAS: HOW TO MAKE (INDUSTRIAL PROCESS)

The ingredients I will use are: milk, non-fat solids, fats, sugar, flavouring, emulsifier and stabiliser.

To make this product in a factory, the following method would be used:

 1. Mix all ingredients in a big mixer.

 2. The mixture would then need to be put into a pasteurisation machine for 15 seconds at 80 degrees Celsius to kill any bacteria.

 3. The mixture now needs to be put in a homogenisation machine to make the fat droplets smaller.

 4. After that, any flavourings would be added before it was beaten quickly to add air before freezing the mixture.

 5. Finally, it would be packaged and stored in a cold store.

The engineers that I will need to manufacture my ice cream are: a Chemical engineer, an Environmental engineer, a Mechanical engineer, an Industrial engineer, a Civil engineer, an Electrical engineer and a Software engineer.

PLAN

I will manufacture my ice cream in the way my diagram shows. As it is a low-fat ice cream my recipe will require low fat ingredients, which is reflected in the recipe where it shows I have used the least amount of fats possible. I have chosen the name Choc-O-Light as I feel that it gets across the message that it is both low in fat and chocolate flavoured - which should appeal to adults and children. I plan for my ice cream to be packaged and sold in larger tubs-perfect for families, or smaller pots that contain a single serving for people who enjoy ice cream as an occasional treat or those following a low-fat diet.

Heat the mixture at 80 degrees c for 15secs to kill bacteria-this is important for health reasons!

A cooling room

Put into a machine to make the fat droplets small

The roles that my engineers will have are:

**Chemical engineers** often use science to process things such as chemicals and they could do this to create my emulsifier and stabiliser to keep my ice cream smooth.

**Environmental engineers** usually help things like improving waste disposal and air pollution but they would give ideas on how my machines could work more efficiently and reduce the pollution level which is important these days as the pollution levels are drastically going up and affecting climate change.

**Mechanical engineer** most of the time focuses on applying engines and machines to design things and to make ice cream they would create and design the machines that produces the ice cream while trying to minimise the use of energy and CO2.

**Industrial engineers** mostly make systems more efficient and get rid of wastefulness and in the ice cream production process they would perform theoretical analysis and taste my product.

**Civil engineers** design things such as dams, bridges, buildings and roads. For me, they would create the factory I would manufacture my ice cream in.

**Biomedical engineers** make things safe to eat and to do that they use things like diagnostic equipment. For the ice cream production process they would make sure my ice cream doesn’t contain harmful substances that could give you food poisoning.

**Electrical engineers** create lights and measure how much electrical power would be required for each floor or room to power things. In my factory they would design the lighting and power systems - which is crucial as I could not produce ice cream in a powerless factory.

**Software engineers** would usually design and create code. In the ice cream manufacturing process they would design and test the code that my machines run on.

Improve

My target audience for this ice cream is those who enjoy eating ice cream but would like it to be a healthier treat. Choc-o-Light would appeal to them because it is a low fat product. The challenges would be sourcing the lowest fat ingredients but still keeping the great flavour and also being able to source the best cocoa powder possible.

Conclusion

The question for this assignment was ’how many engineers does it take to make an ice cream?’ In conclusion, I think it takes 8 different types of engineer to make my ice cream but many more people as the engineers would need to work in teams in order to work efficiently and produce enough ice cream to make sure I could meet customer demand – and therefore make myself rich!

References

The verdict newspaper

[www.sciencekids.co.nz](http://www.sciencekids.co.nz)

Public health England

The Scholars Programme course handbook