

Comparative Study of Bacteria in Different Brands of Yogurt

Liliana Wang

Yogurt is a very common food in people's diet. Many people like yogurt for its nutrition values as well as the probiotics contained in yogurts. The probiotic content in yogurts of different brand varies. This project aims to compare the probiotic content in several popular brands of yogurts. For experiments, I diluted the yogurts and cultured them on agar plates. The colonies grown were observed and recorded for comparison. The results showed that there was a common type of colony growing in every brand of yogurt, which suggests a common species in the yogurts.

Introduction

Yogurt is a cultured or fermented milk product that is soured and thickened by adding specific lactic acid-producing cultures to milk (Yogurt, 2018). It is often considered a good choice for our diet as it contains probiotics and live cultures that are beneficial for our digestive system (Yogurt, 2018). However, not all yogurts contain an equal amount of live and active probiotics and the same benefits to our health. The number of choices in the dairy section of the supermarkets can be overwhelming — low fat, light, fiber-added, Swiss, organic, frozen yogurt — making it hard to recognize which are beneficial and which are not. This project focuses on investigating different types and brands of yogurts that are common in the supermarket to see the amount of live probiotics contained in each of them. This project aims to help customers make a better choice of which yogurt to pick if they are buying yogurt for its health benefits.

Materials and Methods

The specialized materials used in this project include petri dishes, nutrient agar, 1000-scaled pipette, and yogurts from Danone, Daiya, Liberté, and Olympic. Other common materials include alcohol burner, beakers, glass spreader, drop pipettes, scissors, and distilled water.

Agar plates were prepared by microwaving the bottled nutrient agar until it was completely liquified. Then the liquid agar was filled to about one-third of the petri dishes. After each pouring, the lid was partially closed and set until the agar solidified. The unused agar plates were stored upside down in the fridge. Before applying yogurt onto the agar plates, it was diluted in the beaker with distilled water at a yogurt to water ratio of 1: 9, 1: 4, 1: 1, and 1: 1/2. These four solutions were then applied to four agar plates with a glass spreader respectively. The plates were then placed in the incubator for one week before taken out to be observed. The serial dilution and spreading on agar plates were done for yogurt of each brands. All the procedures that involve opening the agar plate were done next to a lit alcohol burner as aseptic technique.

Results

All the plates had colonies growing, especially the Danone yogurt one which has several relatively big colonies (Figure 1,2,3). There is not much growing for the Liberté yogurt.

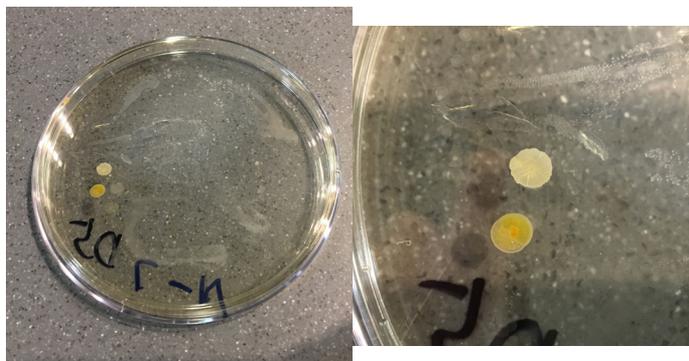


Figure 1. Danone 1 Bacteria Colony. Danone yogurt plates has several relatively big colonies.

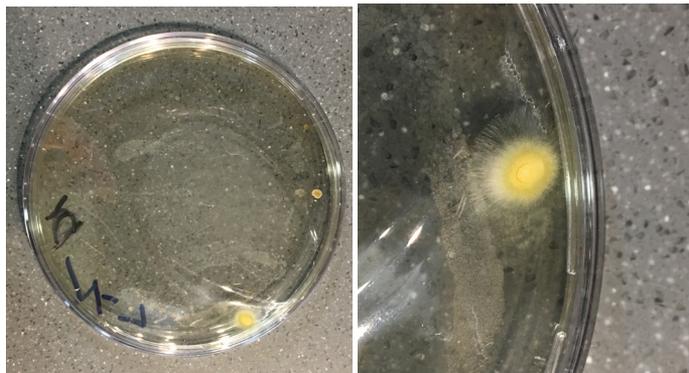


Figure 2. Danone 2 Bacteria Colony. One of the colonies has a greenish-yellow colour with a furry texture. This one was relatively larger than the other colonies and is unique to Danone.

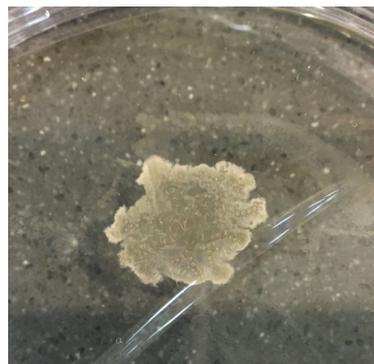


Figure 3. Danone 3 Bacteria Colony. This colony has an almost circular shape with jags on the margin. This is the largest colony grew among all the yogurt cultured. This one is also unique to Danone yogurt.

Looking at the bacteria colony growing results, the experiment procedures were successful. There was no bacteria growing on the control plate with no yogurt applied, suggesting that there was no contamination and the plates were sterile. The growing of bacteria colonies also suggests that the experiment procedures were effective. For Danone yogurt, I was able to get three different types of colonies. One of the colonies has a greenish-yellow colour with a furry texture. This one was relatively larger than the other colonies and is unique to Danone. Another one is an almost circular shape with jags on the margin. This is the largest colony grew among all the yogurt cultured. This one is also unique to Danone yogurt. The third type of colonies are relatively small in size, they are yellow and have a circular shape with smooth margins and texture. Many of the colonies grown possess these similar characteristics. Another specific feature of these colonies is that they all have a darker coloured (almost orange) region with a clear edge in the centre. Colonies in Daiya, Liberté, and Olympic all have these similar characteristics of this third type but in a slightly smaller size.

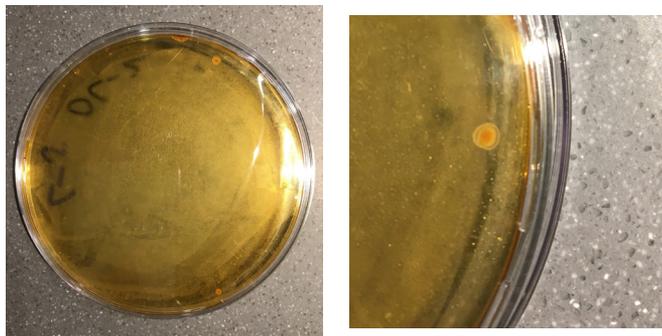


Figure 4. Olympic Bacteria Colony. This plate contained colonies cultured from Olympic yogurt. The colour of the plate is different from the previous ones because a different type of broth was used.

Table

	Danone 1	Danone 2	Danone 3	Daiya	Liberté	Olympic
Size	5mm radius	8mm radius	15mm x 15mm	2mm radius	2mm radius	3mm radius
Shape	Circular	Circular	Circular	Circular	Circular	Circular
Texture	Smooth	Furry	Dry	Smooth	Smooth	Smooth
Margin	Smooth	Furry	Jag	Smooth	Smooth	Smooth
Colour	Yellow	Greenish-yellow	White	White	Yellow	Yellow

Table 1: Bacterial Colony Growth

Discussion

My results showed that the culturing yogurt part of the project was successful. There were clear, distinctive colonies growing for all types of yogurt. However, due to some defects in the experimental design, I am unable to arrive at the results I intended to. One defect of the experiment design is that I am unable to distinguish if the colony is a probiotic

colony or that of other types of bacteria. During the progression of the project, I have researched on ways to recognize a probiotic colony. One of the methods is to extract a colony and put it back into milk to see if it is able to convert milk in to some yogurt like substance. The test was carried out on each colony but it was unsuccessful. Thus, my investigation question shifts to investigate how to distinguish a probiotic colony from other bacterial colonies.

The similarities in characteristics among most of the colonies from various yogurt sources, as mentioned in the results part, suggest that this type of bacteria is probably a common species in yogurts. The two larger colonies are both unique to a specific plate and possess special features, which probably indicates that they are from other sources, a contamination, for instance. One variation of results may occur due to the use of a different culture dish. As seen in Figure 4, the agar used has a different colour, because a different type of broth was used to test out if that promotes the growth. Further experiments are needed however to specify the probiotics from all the bacteria colonies in order to achieve the objective of this project.

References

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