

Serum and skim milk:

The skim milk has fat and the fat was considered by it (zero) therefore the skim milk and the serum are the same.

Affinity and merger:

fat granule + fat granule = (affinity) .



A drop of fat + a drop of fat = a large drop of fat (merging).



In affinity, each fat granule retains its individuality, and if we add an amount of milk, it diverges again as for the merger, it cannot be separated.

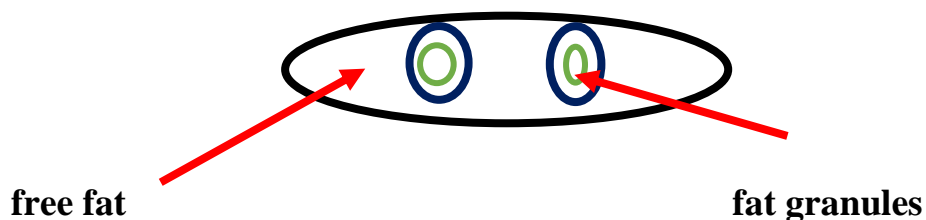
Cluster fatty

Clump fatty

Cluster fatty : They are fat granules close together, separated by a non-fat

part, such as serum and water, and can be returned to fat granules because they are close to.

Clump fatty: It is a free fat external to it, where a mass of fat was formed through the free fat.



It is difficult to break up or disassemble the composition of the **Clump fatty** because the fat is the one that collects the granules, as they are fat granules contiguous through free fat external to them to form (a clump of free fat)

Quantity and percentage:

1- If he took (5) gm of fat + (95) skim milk

$$5 / (5 + 95) * 100 = 5\% \text{ (whole milk)}$$

2- (5) grams of fat +(45) skim milk

$$5/50 * 100 = 10\% \text{ (light cream)}$$

3- (5) gm (fat) + (20) skim milk

$$5/25 * 100 = 20 \% \text{ (thick cream)}$$

We notice from this that(5) gm itself is different is the other substance.

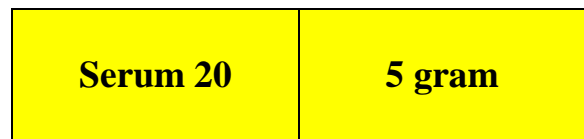
So it became the ratio of fat / interest percentage is close

For example: we take milk with 5 grams of fat

The quantity is fixed / the ratio is changing



(Milk)



(Cream)

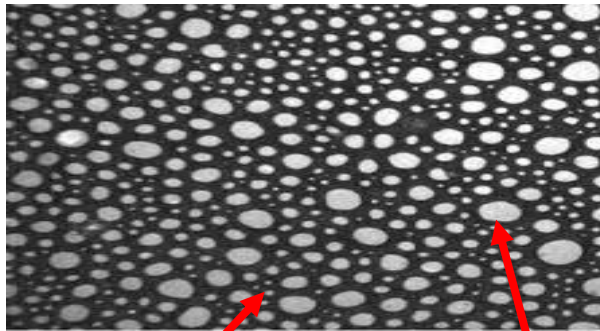
Basis of butter making:

Butter contains (80% fat) +(20% non-fatty substances) (serum)

If we had Separator, it would give cream (80% fat) and the rest (20% serum).

Can it be called a butter? Yes, it can

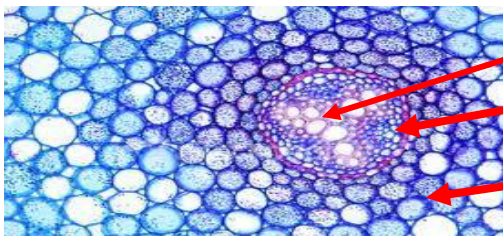
By observing the following two microscopic images:



(serum)

(fat granules)

Cream



Drops of water

Free fat

fat granules

Butter

The percentage is the same, but the difference is in the case of fat, where cream is(80% fat) and the remaining(20% is serum).

This is called plastic spandex cream.

As for the first, it is considered butter.

The difference is not in the proportions and components. Rather, the difference is in the case of the component fat.

In the case of the cream, we notice the fat in the form of grains spread in a liquid, while in the case of butter, the fat is present in the form of a piece fused with each other because most of it is free fat where fat + fat merges, and sometimes we notice remnants of the fat granules that were not It breaks down, and we see it in the butter that was made in agitation or by some continuous methods, while we sometimes notice some continuous methods that produce butter that is only free fat and has water droplets distributed in it.

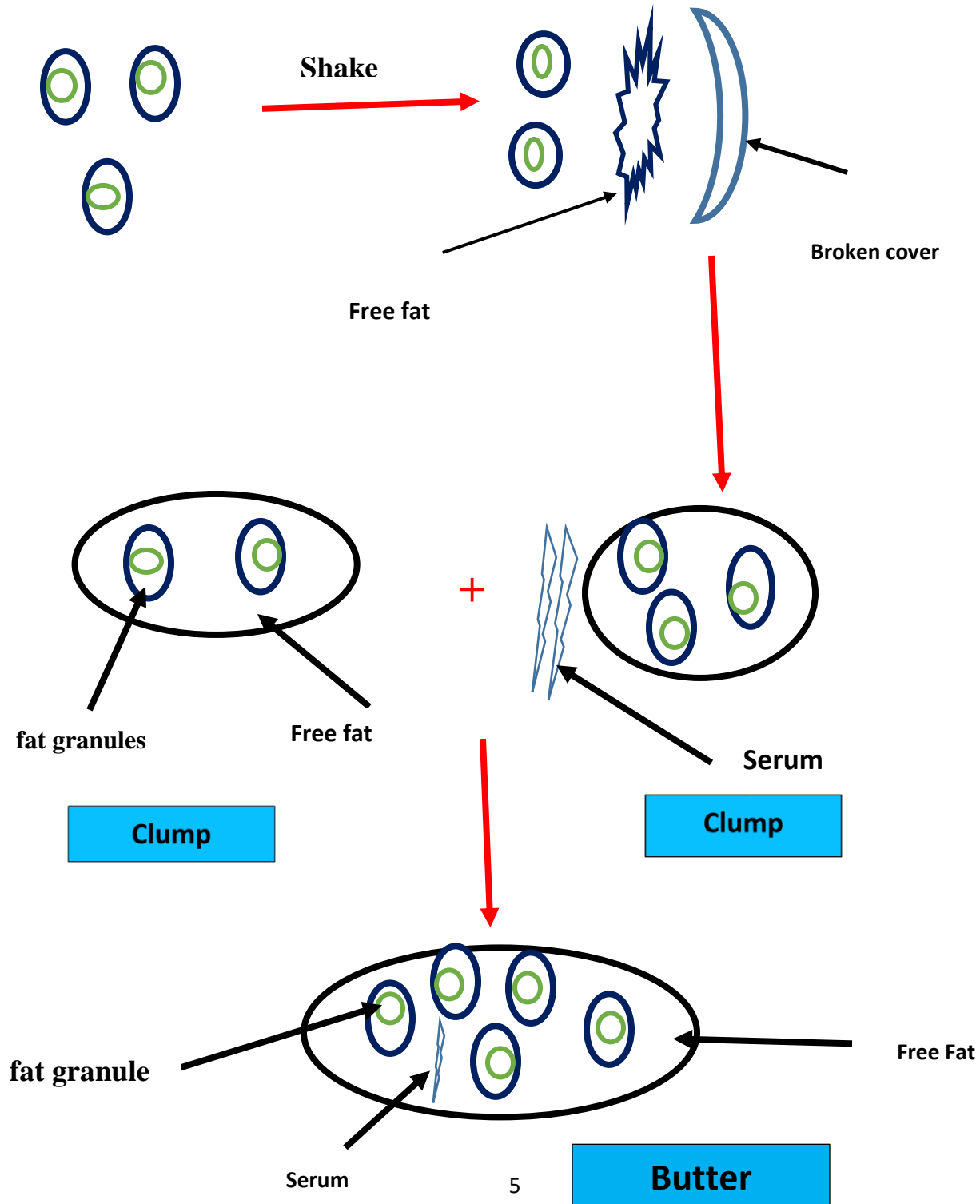
The first can be diluted with cream, while the second cannot be diluted, as in the second it is free fat that cannot be diluted

Which is the difference being whether the fat is inside the granules or is free fat.

If the fat granules are torn to shred their coatings, the free fat appears from each granule and merges with each other, and if it encounters some of the granules that did not break, then the component of the fat mass adheres to them and the last fat may merge with another fat mass to form a larger mass

Thus, until these blocks become large, you can see with the eye

So it is or is now called a butter seed, meaning that the nucleus of the butter seed or butter (clump) and traps some water between them and thus forms the image of butter seen under the microscope.



From this it appears that the butter industry needs a free fat that has the ability to stick together and stick to other greasy granules, if any, and this needs to release the fat from the inside of the granules, and so it is done by shaking

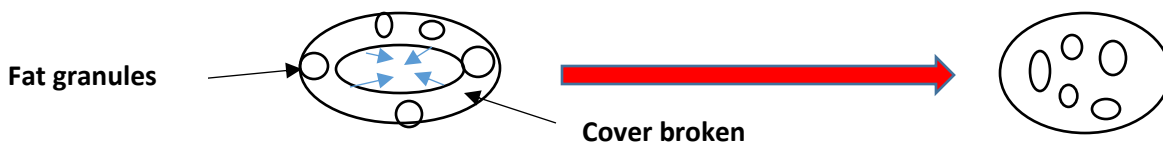
That is, the collision of the granules and The fat needs to be in a semi-solid state in order to be a sticky substance, and this means cooling to a certain temperature, so it is said that the basis for obtaining butter is

1- Shake

2- That it be at a cold temperature ranging from (8-15)°C.

Butter formation theories:

1-The foam theory considers the presence of foam necessary, as the lipid granules that are collected by some casings of the chipped particles are spread around the air bubble and when the shaking process continues the bubble bursts. With another bubble to with other blocks and the same thing happens to it until the butter seed gets bigger.



Objection to this theory through:

1-The coatings of fatty granules are not the aggregation of granules, but the free fat.

2- Possible to obtain butter in a chaker vacuum.

So the theory of collision or self-deluge appeared

Which considers that free fat is important in the collection of fat granules, whether on the packaging of bubbles or without them

The foam is important in speeding up the butter

Example: Sometimes you take plastic cream and break the casings with a knife, so that free fat comes out and becomes a complete mass.