



TECHNICAL APPLICATION
INFORMATION



**The Classic CM 300 Series
– Pectins with Additional Benefits –
A New Generation of Pectins
for Application in Acidified Milk Products**

CLASSIC CM 300 SERIES – PECTINS WITH ADDITIONAL BENEFIT –

A NEW GENERATION OF PECTINS FOR APPLICATION IN ACIDIFIED MILK PRODUCTS

Milk is a really great and a healthy thing. Milk contains everything which helps you growing up and getting strong: Calcium, vitamins and much more. So says Yannick’s mom. So far, so good. Unfortunately her arguments do not seem to impress him at all. No well-meant words or promises can make the 6 year old boy drink a glass of milk, no matter if warm or cold, in the morning, at noon or in the evening.



Yannick does not like milk. He says milks creates an unpleasant feeling in his mouth. Fortunately there are products in the market largely combining mom’s care and Yannick’s likings: milk-based soft drinks or yoghurt drinks. Among experts these products are called “Acidified Milk Drinks”.

The exact name is not at all important for young consumers like Yannick and neither for older ones. The important thing is that it tastes good following up the promise to contribute to a healthy nutrition.

Indeed, there are already many suchlike products in the market, nevertheless the existing product range leaves still enough leeway for innovations. Thus traditional products are more and more combined with functional components. And this fact influences the production technology.

Product	Pectins	Properties	Pectin Type	recommended Dosage
acidified milk drinks	high methylester pectins	protein stabilisation, increase of viscosity	Classic CM 201	each 0.2 – 0.5%, depending on product and process
			Classic CM 202	
			Classic CM 203	
			Instant CM 203	
			Classic AM 201	

PECTINS FROM HERBSTREITH & FOX

For application in acidified milk products H&F successfully offers a wide range of different apple and citrus pectins already for many years.

BACKGROUND

The manufacture of acidified milk drinks is effected either by fermentation or by direct acidification using fruit juice or fruit acid – usually up to reaching a pH-value between 3.7 and 4.3. If living lactic acid bacteria are desired the products will be offered fresh. For a longer shelf life, however, they have to be heated.

The diversity of recipes is also reflected in high and low protein contents (expressed as MSNF = Milk Solids Not Fat), amount of added fruit juice or the addition of all kinds of fruit preparations.

Without adding a stabilising agent all these acidified milk drinks become instable already after short time due to protein agglomeration and coagulation as well as due to whey separation. Furthermore, the heat-treatment in an acidic environment leads to a contraction of proteins caused by the loss of their hydrate cover (dehydration). Thus, the proteins show a sandy structure and sediment.

The use of pectin prevents this process. High methylester citrus and apple pectins provide excellent flavor release and functionality in the acidic pH-range between 3.7 and 4.3 and are thus the preferred stabilisers for these systems.

The stabilising mechanism is effected by electrostatic and steric interactions between a negatively charged pectin molecule and the milk protein which is positively charged in the pH-range of yoghurt drinks. Due to the distribution of their ester groups within the molecule pectins have zones with different charge density and thus with different affinity towards binding to protein. Zones with high affinity cover the protein surface and prevent agglomeration of protein, zones with low affinity protrude from the surface into the fluid thus contributing to a so called steric stabilisation.

In addition to its function as protective colloid pectin as a hydrocolloid is able to increase the viscosity of beverages and to develop mouthfeel, if requested. Mouthfeel is one of the decisive factors if a product is well accepted by consumers or not. It describes the sensory impression from first palatal contact up to swallowing and the after taste of food.



Stabilised Acidified Milk Drink (3% MSNF)

Pectin Classic CM 304

Ingredients

- 30.0% skimmed milk yoghurt (10% MSNF)
- 1.5% sugar (sucrose)
- 10.0% pectin solution (2.5%)
- 58.5% water

Manufacture

- A Prepare a 2.5% pectin solution and cool down.
- B Mix sugar, remaining water and pectin solution.
- C Add mix "B" to the yoghurt under stirring (Ultra Turrax).
- D Adjust pH-value to pH 4.2 with sodium citrate solution (10%) under stirring.
- E Homogenise 150 bar.
- F Pasteurise at 85°C for 15 minutes, cool down to 20°C.

BENEFIT

Currently the product range of H&F is supplemented by the Classic CM 300 series. These are high methylester citrus pectins which are distinguished by some additional benefits in specific applications compared to the pectins of the Classic AM/CM 200 series.

H&F developed the Classic CM 300 pectin series to complement the existing product range of pectins for use in acidified milk drinks being successfully applied in a wide application range already for a long time. Some applications require special properties and here the pectins of the Classic CM 300 series perfectly fit due to their additional benefits.

Acidified milk drinks with low protein content often show a very low viscosity. During storage time – no matter if in shops or the consumer's refrigerator – it is possible that

sedimentation of the beverages or ring formation with clearing of the beverages occur. With applying the recently developed pectins of the Classic CM 300 series these undesired effects are reduced or even prevented.

Acidified milk drinks with low protein contents often lack in mouthfeel. By applying pectin in a dosage higher than necessary for stabilisation it is possible to increase viscosity and thus to reach the desired mouthfeel. This procedure, however, is often not an economic one.

Figure 1 shows that pectins of the Classic CM 300 series are able to reach a higher viscosity than those of the Classic CM 200 pectin series at the same dosage do. Hence the new pectins provide advantages regarding dosage. A more economic production is possible, especially in case of recipes with low protein content if a higher viscosity is wanted.

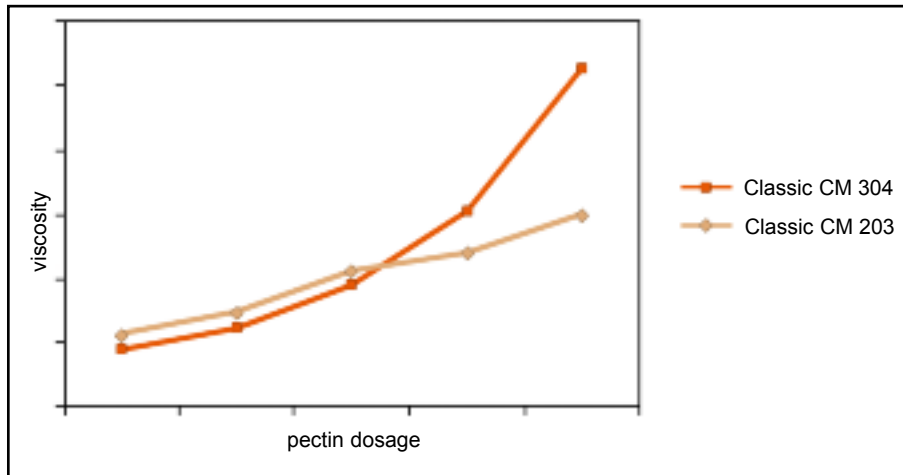


Fig. 1: Viscosity of Acidified Milk Products 3% MSNF – with heat treatment

Due to nutritionally physiological reasons also yoghurt drinks can be enriched with calcium. For the stabilisation of such calcium enriched yoghurt drinks by experience a slightly higher pectin dosage is necessary. Pectins of the new generation behave much more tolerant towards present calcium ions and are able to stabilise yoghurt drinks also without increased pectin dosage.

Also towards added table salt in yoghurt products type Ayran – with table salt contents up to 1% – the new pectins show a higher tolerance. With an adequate processing technology these pectins provide stable and exceptionally pleasant products.

Pectins of the Classic CM 300 series are notably tasteless and thus specially suited for use in taste sensitive products.

In order to cover the requirements of different application fields the standardisation of the pectins of the Classic CM 300 series is effected specifically for recipes with different protein contents. The table below shows the different pectin types and their optimal dosages necessary for stabilisation.

CONCLUSION

H&F has already successfully established pectins for acidified milk products in the market. With developing the novel Classic CM 300 pectin series based on long-time experience H&F is able to offer a new generation of pectins: pectins with additional benefits.

This innovation opens up possibilities for our customers to optimise their products and, moreover, to launch high quality novel products.

Pectin	Manufacture of a stabilised acidified milk drink	
	8% MSNF EV-Recipe 400 [% OSD]	3% MSNF EV-Recipe 405 [% OSD]
Classic CM 301	0.15 – 0.20	0.10 – 0.15
Classic CM 303	0.20 – 0.25	0.15 – 0.20
Classic CM 304	0.25 – 0.30	0.20 – 0.25
Classic CM 305	0.30 – 0.35	0.25 – 0.30

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