



Common quality issues homogenizers solve

DAIRY, HOMOGENIZATION

From flavour to sedimentation to mouthfeel, homogenization can solve a number of quality challenges for a range of food and beverages. Two of the key challenges are faced in multiple beverage categories and are highlighted here.

Keep it together: preventing separation

Without homogenizers, modern dairies would not be able to produce a homogenous milk product that remains stable without the cream rising to the top. The small reductions in the size of the milk fat globules as they pass through a homogenizer have a big impact on their tendency to ascend.

As can be seen from the table below, sedimentation and separation are also an issue for producers of rice, nuts, grains and soy ([RNGS](#)) beverages, which are often formulated to liken milk. These drinks usually contain a source of fats such as vegetable oil making them an emulsion between fat and water. Just like the cream of the milk, the oil has a tendency to rise. Homogenization prevents this happening by stabilizing the emulsion. It also breaks up the large particles of fibre present in these beverages in order to prevent fibre sedimentation.

One other function of [homogenization](#) is to break down the protein to prevent protein agglomeration after heat treatment. All this ensures a longer shelf-life and better appearance for RNGS beverages.

If you have ever made your own juice in a juicer, you will have noticed that the fibres soon start to separate out to the bottom. One of the prime purposes of using a [homogenizer in juice](#)

[processing](#) is to prevent this happening and thus to stabilize the cloud. During homogenization, fruit and vegetable cells rupture by the application of pressure to pass through a narrow gap.

The higher the pressure applied, the higher the cost in terms of energy consumption. The skill in homogenization is to apply just enough pressure to achieve the desired breakdown of the particles. Eagle Liang is Tetra Pak's Product Manager for homogenizers and, in his experience, pressure over 200 bar is not normally needed in the juice industry. "The excessive use of pressure just adds unnecessary costs that eat up margins without improving juice quality," he says.

	White milk	Flavoured milk	Juice/Nectar	RNGS*	Tomato
Prevent sedimentation and separation	●	●	●	●	●
Achieve stable cloudiness			●		
Achieve higher viscosity			●	●	●
Improve mouthfeel			●	●	
Reduce need for additives			●	●	●
Improve colour and/or flavour	●	●	●	●	●

*Rice, Nuts, Grains and Soy products

50 shades of white. Or orange

Have you ever taken a close look at the colour of a glass of milk? Obviously the creamier the milk, the more yellow it looks. Skimmed milk has a whiter appearance. In the case of fat-free milk, it has a slightly blue hue. [Homogenization can enhance the colour of milk](#) because it changes the refraction index. The smaller particles scatter light differently from larger ones and this makes homogenized milk look whiter. In India, buffalo milk is a premium milk that is very

white in colour. When cow milk is homogenized, it becomes as white as buffalo milk and is therefore perceived in a more positive way by Indian consumers.

Colour is also a selling point for juices by making them more attractive and appetizing. Not just the colour of juices improves due to homogenization, but also their nutritional content. More of the intracellular material is released into the juice and becomes available for digestion. Homogenization releases more of the nutrient lycopene (red pigment) in tomatoes and more of the beta-carotene (orange-red pigment) in carrots.

When it comes to flavour, the release of intracellular material gives more flavour naturally without adding artificial flavouring. Heat is also an important factor in processing because using lower temperature treatment retains natural taste and flavours better.

Many modern homogenizers are designed to use lower pressure to achieve better product quality. Since the implosions caused by the rapid release of high pressure can generate heat within the homogenizing device, lower working pressure means lower heat impact.

“We see more and more customers who prefer less heat impact,” says Eagle Liang. “For example, they prefer using VTIS to preserve flavour and one-step UHT. Whenever possible, customers are willing to invest in new processes or equipment designed with a low temperature profile. Everybody is seeking a solution which can achieve consistent high product quality by the [use of less energy](#).”

To find out more about common quality issues homogenizers solve when it comes to rice, nuts, grains and soy beverages:

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