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a natural chemistry

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NUTRITION

ICE CREAM

Ice cream is a unique food system as it is both an emulsion and a foam. This implies that two different interfaces exist: the fat/water and the air/water interface.

The freezing point of the main ingredient, water, is altered by the addition of sugar. This allows the water to be both in a liquid and solid state. Other essential ingredients are fat, non-fat milk solids, stabilizers and emulsifiers. In vegan ice cream, next to the usage of vegetable fats, non-fat milk solids are often replaced by non-fat plant solids such as pea protein.

CHALLENGES

Texture is a critical parameter of ice cream quality: it should be creamy and soft but may not melt too fast. Next to this, striving for an optimal overrun is key.

Emulsifiers aid by displacing proteins at the fat globule surface which promotes fat destabilization. As a result, the fat globules partially coalesce and form a 3D network. This stabilizes the air cells and contributes significantly to the overall texture and overrun of ice cream.

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WE KNOW IT'S **MORE THAN** ICE CREAM

- Optimized **overrun**
- Postponed **meltdown**
- **Creamy texture**
- Enhanced **water crystallization**

APPLICATION TEST

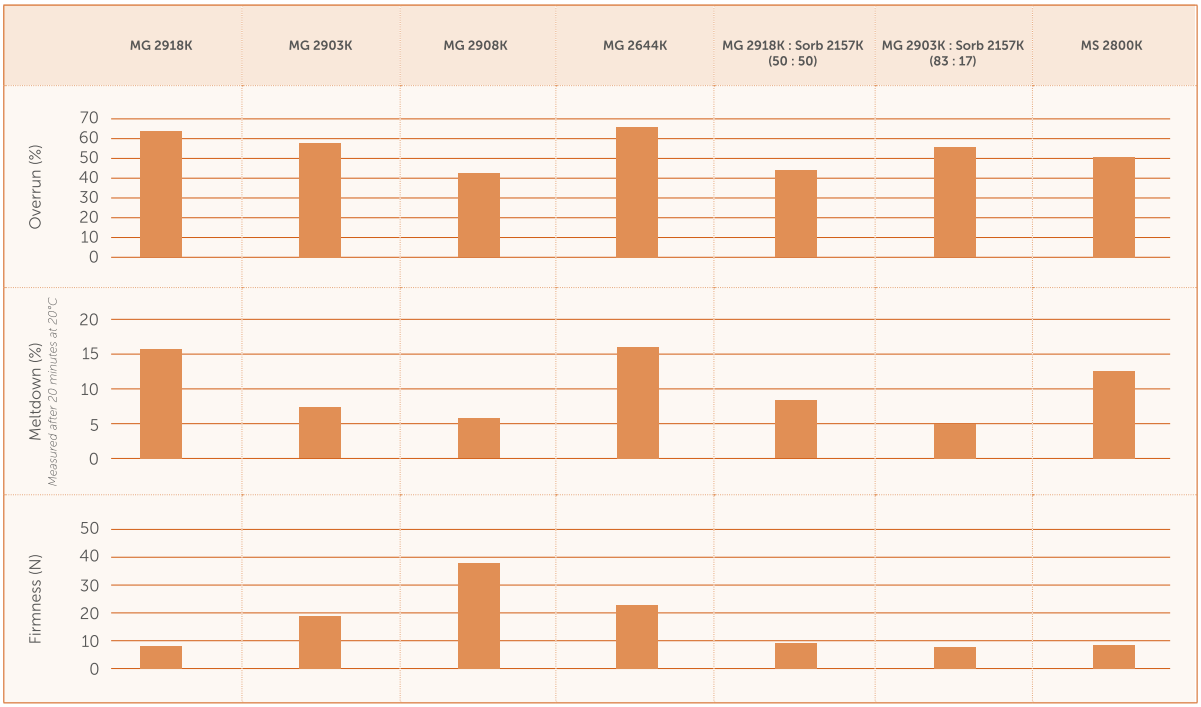
Formulation

Low fat, low sweet dairy ice cream

Liquid dairy cream	14.29%
Skimmed milk powder	1.72%
Sugar	10%
Dextrose monohydrate	2%
locust bean & guar gum	0.2%
Emulsifier	0.4%
Water	71.39%

EMULSIFIERS		
	Mono- and diglycerides	
	Total mono (%)	*IV (g I_2/100 g)*
MG 2918K	≥ 90	≤ 2
MG 2903K	≥ 93	18-26
MG 2908K	≥ 90	35-45
MG 2644K	56-60	≤ 3
Sorb 2157K	Polysorbate 80	
MS 2800K	Mixture of mono-and diglycerides and polysorbate 80	

Results



Conclusion

Depending on the type and the characteristics of ice cream, different emulsifiers are required. Saturated mono- and diglycerides such as Radiamuls MG 2918K and 2644K are ideal for a **high overrun.** A high HLB emulsifier such as Radiamuls Sorb 2157K will **lower the meltdown rate.** The same effect is obtained by using unsaturated mono- and diglycerides such as Radiamuls MG 2903K and 2908K. When the key requirement is **firmness and shape retention,** Radiamuls MG 2908K, 2644K, or 2903K are advised.

OUR **SOLUTIONS**

» **Mono- and diglycerides of fatty acids**
Radiamuls MG 2918K, 2644K, 2903K, 2908K

» **Polysorbate 80**
Radiamuls Sorb 2157K

» **Blend of mono- and diglycerides and polysorbate 80**
Radiamuls MS 2800K

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