Emulsifiers: should we be avoiding them?

By Susan Low

Emulsifiers are regularly used to combine foods that ordinarily wouldn't mix – for example oil and water. But in recent years questions have been raised about their impact on people's diets and health. Do we need to be concerned?

The name 'emulsifier' may conjure up images of science experiments but if you're a keen home cook, chances are that you're already familiar with what emulsifiers do. Have you ever made **your own mayonnaise** or whipped up a **quick vinaigrette**? If so, then you've successfully created an emulsion.

Simply put, emulsifiers make it easier for two (or more) substances to combine into a single, cohesive whole. Give the ingredients a good shake, a thorough whisk or a few minutes' processing and you will end up with a thick, smooth, perfectly combined dressing or sauce.

To make mayonnaise, egg yolks – which are rich in lecithin (a natural emulsifier) – hold the sauce together. In salad dressings, a dab of mustard helps to bind the oil and vinegar. Another emulsified sauce is **hollandaise sauce**, which relies on clarified butter and egg yolks to bind. For **salad cream**, another type of emulsified sauce, cooked egg yolks and a touch of cream do the trick. Tomato purée and miso can also be used to help combine ingredients into smooth,

thickened sauces.

Emulsifiers in the food industry

Away from the home kitchen, the range of emulsifiers expands well beyond store cupboard staples. Some emulsifiers are naturally derived, some manufactured, and they are used for a variety of purposes in a wide range of foods.

Dr Alicia Sandall, a registered dietitian and post-doctoral researcher at King's College London, explains: "Emulsifiers can have many different functions in food – for example, retaining water for freshness, strengthening dough crumb texture, reducing the melting rates of frozen foods, lengthening the shelf life of cream-based foods, as gelling agents and as a vegetarian alternative to gelatine."

Emulsifiers are nothing new adds Sandall. "The practice of adding substances to foods such as emulsifiers to enhance their appearance, taste, texture and shelf life has occurred for hundreds of years."

Foods that commonly contain emulsifiers include pastries, cakes, milkshakes, ice cream, desserts, chocolate, bread, margarine, nut butters (the emulsifiers prevent the oil from separating out and sitting at the top), plus pre-made frostings and icings, ready meals... The list is a long one.

So, what are emulsifiers?

Acacia, also known as gum arabic is frequently found in sweet ready-made dishes

Tanya Hafner, a registered dietitian and founder of MyNutriWeb, says: "Emulsifiers can be man-made or naturally occurring. Many emulsifiers used today are of a naturally derived

variety called hydrocolloids. These serve as **thickening agents** and support the structure, texture, flavour, and shelf life of various food products, and they are often referred to simply as 'gums' because of the food texture and consistency they create."

Some are made from plants and aquatic sources. Locust bean gum, for example, is made from the beans of the carob (locust bean) tree and is used to extend the shelf life of confectionery products. Carrageenan, made from red seaweeds, is used as a thickener for soy milk, milkshakes and the like, its gel-like consistency giving them a thicker texture and preventing crystal formation in ice cream.

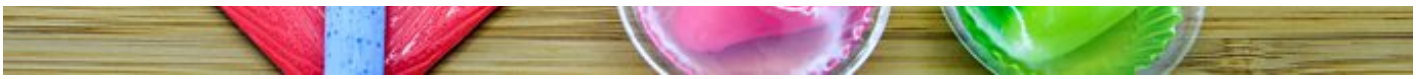
Lecithin is a natural emulsifier and is found in soybeans, egg yolks and other foods. Read the label on a chocolate bar and you're likely to see 'soy lecithin' listed. It's often used in chocolate confectionery as a replacement for cocoa butter, and it makes chocolate easier to temper and mould.

Xanthan gum, often used as a thickener or stabilising agent, is a product of **microbial fermentation** . Many gluten-free bakers, home bakers and commercial bakers alike, use xanthan gum to give that elusive elasticity and open texture to bread that the gluten in wheat would otherwise provide.

In the commercial baking industry, certain types of emulsifiers (such as **mono and diglycerides** and **sodium stearoyl lactylate**) are used as 'bread improvers' and 'dough conditioners', which are used to make factory-style production faster and easier, and to extend the finished loaf's shelf life. Agar, derived from algae, is a vegan alternative to gelatine.

Other emulsifiers you might find in products on supermarket shelves are acacia, also known as gum arabic, which is used in cake decorations, frozen desserts and soft-drink syrups; lactic acid esters, used in ice cream and imitation creams; and acetic acid esters, used in cakes and shortenings.

Are emulsifiers safe?



Emulsifiers turn up just about everywhere in processed foods. The good news is they are very easy to spot – provided you read the label. Emulsifiers are **food additives** and, by law, manufacturers must provide information about any additives used and must list them on the label, along with their E number and state what the additive is used for. The Food Standards Agency (FSA) has a handy list of **E numbers** on its site.

But are emulsifiers safe? “Research suggests that emulsifiers, especially those that are naturally derived, are safe,” says Hafner. “In the UK, the FSA oversees the safety of food in the UK. Food additives need to be checked for potential harmful effects on human health before they can be used.”

But, Hafner points out, “Although emulsifiers are used in small quantities, their abundance in packaged foods has caused many to question if they could potentially cause harm. The FSA reviews the safety of approved food additives based on the best, most up-to-date research.”

Some emulsifiers have been a topic of controversy. In 2015, research carried out by **Georgia State University, USA** suggested two emulsifiers commonly used in processed foods (carboxymethylcellulose and polysorbate-80) could unbalance gut microbes in mice and cause weight gain and inflammation. The authors also suggested that the broad use of emulsifying agents might be contributing to a society-wide increase in obesity and chronic inflammatory diseases.

Professor Kevin Whelan, professor of dietetics at King’s College London, says of the Georgia paper: “The major study in recent years to advance our understanding of emulsifiers was undertaken in mice, not in humans. It showed that some specific emulsifiers impacted the microbiome in the gut, reducing the mucus that lines the gut and protects the gut from invasion by bacteria. The mice then experienced greater gut inflammation.”

The emulsifier carrageenan has also been the topic of some debate for decades, with animal studies suggesting it can **compromise human health**. In 2018, the European Food Safety Authority re-evaluated the safety of carrageenan and a similar seaweed-derived emulsifier. The **EFSA approved their continued use** – although Tanya Hafner points out: “While carrageenan is still considered safe, **some research** suggests that it may cause, or amplify existing, gastrointestinal (GI) inflammation.”

Animals are not people, of course, so conclusions about human health can’t be drawn from animal studies. And, as Sandall says, “It is also worth noting that experimental doses of emulsifiers given to animals in these studies are often much higher than average human consumption.” More research – on the impact on humans – is needed in this area.

Can emulsifiers be beneficial to health?

There is also evidence that certain emulsifiers can have some health benefits. Hafner says: “It depends on the type of emulsifier and amount used. Some of the gums can be a source of soluble fibre and most of us can benefit from eating more fibre.”

Dr Adele Costabile, reader in health sciences at University of Roehampton, says, "Soy lecithin and guar gum may lower cholesterol levels, and several studies have linked acacia and xanthan gums with improvements in insulin function among people with type 2 diabetes. Acacia also appears to act as a **natural prebiotic**, feeding the beneficial bacteria in the gut."

For most people without existing health problems (such as irritable bowel syndrome), there is no need to avoid emulsifiers say experts. "As yet, we cannot say that people should avoid eating emulsifiers," concludes Whelan. "They are contained in a wide range of foods, and some may have healthy nutritional properties. Therefore, in the meantime, most scientists, dietitians, and doctors would recommend that it is sensible to eat a diet that contains more unprocessed, natural plant foods."

The scientific community will continue to conduct research on emulsifiers and human health, and the safety of emulsifiers is under regular review. So, eating a balanced diet, upping your intake of fresh veg and limiting the amount of processed food you eat is always good advice – but there's no need to say no to the occasional ice cream.

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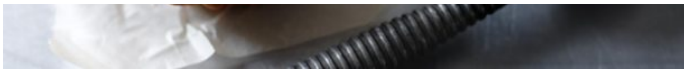

Easy ice cream