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ESG Summer Series

Ice cream: deliciously sustainable?

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- Ice cream is an increasingly popular treat around the world…
- …but investors should be aware of sustainability issues ranging from climate change to labour conditions
- Investor scrutiny of retailer commitments could help ensure ice cream is more sustainably delicious

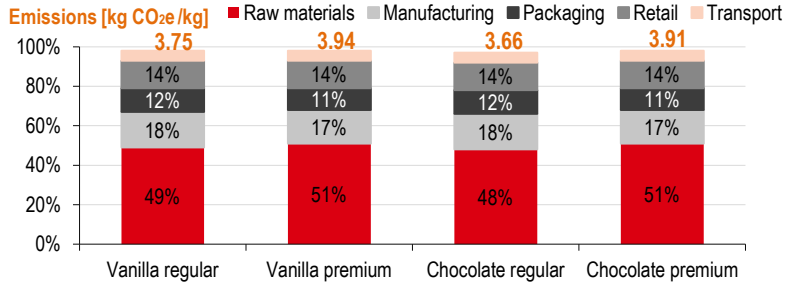
*This is the first report in our **ESG Summer Series** – looking at sustainability issues in less obvious places. These issues could grow to become bigger trends in the future.*

Scooping it up: The ice cream industry is growing globally. According to *Fortune Business Insights*, the ice cream market could grow from cUSD74bn (2022) to USD105bn by 2029. Rising demand for innovative flavours and higher consumption, especially in developing markets, are among the key drivers.[1] We think this increased consumption could bring enhanced stakeholder focus on sustainability aspects.

Before it melts: The climate impact of ice cream is arguably higher than many other treats. For example, the emissions from producing 1kg of premium vanilla ice cream is 3.94 kg CO_2e (figure 1), which is 1.8x the climate impact for producing the same quantity of cupcakes and 2.2x for chocolate-coated biscuits.[2] In our view, there could be growing scrutiny of retailers' commitments to reducing the climate impact of ice cream.

Out of the freezer: Climate impact is far from the only area where investor (and other stakeholder) scrutiny has the potential to encourage more sustainable practices in this tasty sector. In this short note, we look at the top three contributors towards ice cream's environmental impact (raw materials, manufacturing and retail, and packaging) and social issues associated with popular flavours (vanilla and chocolate). We also consider how the ice cream sector is impacted by climate change, and what mislabelling and marketing practices investors should be aware of. We think that while investors should be aware of how ice cream is sourced, produced and sold, they should also consider that it does not (and might not) last forever.

1. Climate impact of ice cream



Source: 2019 University of Manchester Study
The 'premium' variety has a higher content of milk fat and sugar, contains eggs. Vanilla premium contains vanilla, the regular has an artificial flavouring agent (vanillin). The premium chocolate variety has also more cocoa powder than its regular equivalent.

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1 Grand View Research, Ice Cream Market Size, Industry Report, 2022-2030
2 A Konstantas et al, Evaluation of environmental sustainability of biscuits at the product and sectoral levels, Journal of Cleaner Production, 2019

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Environmental impacts of raw ingredients

Environmental issues of raw ingredients are wide ranging

Dairy farming and cultivation of other raw materials used for making ice cream are associated with a number of environmental impacts.

The impacts of milk include:

- Climate impact (e.g. methane produced by cows)
- Water consumption (mainly used to grow feed for dairy cattle)[3]
- Agricultural land occupation
- Freshwater and marine ecotoxicity (e.g. pesticide and fertiliser usage to grew feed)
- Water eutrophication (as nitrogen and phosphorus in animal feed are absorbed by cows to a limited extend; their manure, for example, may cause algal blooms).

The key impacts of other raw materials (e.g. cocoa, vanilla) include:

- Freshwater and marine ecotoxicity (e.g. pesticide and fertiliser usage especially during cocoa production)
- Deforestation and biodiversity loss (e.g. due to cocoa production or use of palm oil which threatens tropical rain forests)[4]
- Water consumption (mainly green water consumption, resulting from the cultivation).[5]

In our view, investors could make a difference by scrutinising retailers' commitments to reducing the environmental impacts of ice cream. The climate impact of milk, for example, could be reduced by modifications of cows' feed to reduce methane production. Research suggests that a 50% replacement of dried by fresh grass in combination with manure composting could reduce climate impact by 16%.[6] Ecotoxicity caused by cocoa cultivation could be addressed by reducing the use of conventional fertilisers and/or replacing them with organic alternatives, as well as reducing the amount of pesticides applied.[7]

We think the new deforestation law approved by the EU will prompt palm oil and cocoa growers to improve their practices ensuring that these ingredients are not produced from plants grown on deforested land.

Social impacts of raw ingredients

Vanilla

Concerns regarding child labour and tough working conditions

While some mass-market producers now use artificial vanillin flavourings (extracted from wood pulp or produced synthetically using by-products from the paper industry and petrochemicals), real vanilla remains an ingredient in some ice creams, especially high-end products. It is the second-most expensive spice (after saffron) in the world due to its sophisticated and labour-consuming production process. The orchid, which produces vanilla beans, originated in Mexico; it is pollinated by wild Melipona bees there. Since there are not a lot of bees in other top vanilla-producing countries, each flower must be pollinated by hand.[8]

Investors are increasingly scrutinising retailers' approach to protecting workers as media and different organisations regularly highlight *child labour* and *harsh working conditions* in the vanilla sector.[9] Madagascar is the world's leading producer of vanilla, representing about 80% of the

3 WWF, Milk's impact on the environment, 2019
4 WWF, Ice cream's impact on the environment, 2016
5 A Konstantas et al, Environmental impacts of ice cream, Journal of Cleaner Production, 2018
6 A Konstantas et al, Environmental impacts of ice cream, Journal of Cleaner Production, 2018
7 A Ntiamoah and G Afrane, Environmental impacts of cocoa production and processing in Ghana: life cycle assessment approach, The Journal of Cleaner Production, 16 (2008)
8 Danwatch, Every single vanilla orchid must be pollinated by hand
9 For example, P Lykke Lind, Madagascar's £152m vanilla industry soured by child labour and poverty, The Guardian, 2016

global supply.[10] A study by the International Labour Organization reported about 20,000 children aged 12 to 17 working in vanilla production in Madagascar, accounting for more than 30% of the sector's workforce. Fair Labour Association highlights that vanilla is mostly produced by about 80,000 smallholder farmers, where lack of training on health and safety (e.g. the use of sharp tools and scorpions bites when workers dig soil with their hands) and personal protection equipment (e.g. gloves) is evident.[11] In our view, pressure on retailers to address social issues throughout their supply chains will continue to increase.

80%

Percentage of the vanilla global supply produced in Madagascar

Cocoa

Harsh working condition in cocoa industry are evident

We think investor focus on transparency of firms' supply chains in cocoa industry will continue to increase, as *labour conditions* in the sector are of concern. Chocolate flavour is one of two leading flavours globally, occupying nearly 18% of the total market share.[12] According to the World Cocoa Foundation, approximately 70% of cocoa is produced in West Africa, predominantly Ghana and Côte d'Ivoire. Small scale farmers are the beginning of a complex, fragmented supply chain, which often includes harsh conditions; limited access to water, sanitation, health and education services means that many producers are below the poverty line. In our view, in addition to these concerns, rising temperatures and the impact of heat stress on workers' health should be among the key considerations of working conditions.

Opportunities to reduce production-related energy intensity

Key manufacturing and retail impacts

Manufacturing impacts are mostly attributable to *energy consumption*, particularly due to the hardening process and deep freezing. Considering annual consumption of ice cream in the UK, the total primary energy demand contributes to 3.8% of energy consumption in the whole food sector. In our view, there is an opportunity to reduce the energy intensity of the manufacturing stage by optimising energy and using more low carbon energy sources.

We think investors should ask companies for more detail on how they reduce the retail-related impact on *ozone depletion*, which is mainly due to the storage time and leakage of refrigerants. Research suggests that these impacts are highly sensitive to the duration of storage and the type of refrigerant. For example, by shortening the storage time from 7 to 3 days, the impact of ozone depletion is reduced by more than half (54%). And with the extended storage of 14 days, ozone depletion increases by 95%, primarily due to refrigerant leakage. At the same time, using R22 refrigerant instead of R134a would reduce ozone depletion by 74%.[13] In addition, better insulation in ice cream freezers and lowering shipping temperatures (e.g. Unilever testing a move from -18°C degrees to -12°C)[14] are among the options.

10 P Lykke Lind, Madagascar's £152m vanilla industry soured by child labour and poverty, The Guardian, 2016
11 Fair Labour Association, A Tale of Two Supply Chains: Child Labor in the Vanilla Sector in Madagascar, June 2021
12 A Konstantas et al., Environmental impacts of ice cream, Journal of Cleaner Production, 2018
13 A Konstantas et al., Environmental impacts of ice cream, Journal of Cleaner Production, 2018
14 Unilever press office, Unilever 'warms up' ice cream freezers to help tackle emissions, May 2022

Packaging

Scope to use environmentally friendly packaging solutions

In our view, stakeholder attention to reducing the impacts of packaging, e.g., *fossil fuel depletion*, *energy demand* and *waste management*, will continue to increase. Polypropylene tub, which is the most-widely used packaging material for manufactured ice cream, is a notable hotspot for these impacts. Research suggests that replacing polypropylene with high density polyethylene packaging reduces the effect on fossil fuel depletion and primary energy demand. Some brands are planning to introduce or have changed ice cream packaging from a multilayer to a monolayer wrapper (e.g. Unilever Indonesia), paper-based wrappers (e.g. Nestle), or fully biodegradable (e.g. Northern Bloc, Little Cow & Cookies). We think these moves will help reduce the percentage of plastic packaging ending up in landfills.

Will climate impacts melt the ice cream industry?

Climate change also impacts ice cream industry

We think investors should also consider how the ice cream sector is impacted by climate change and how companies respond to these challenges. For example, rising temperatures affect cow's milk productivity; in hot climate conditions, they tend to eat less, and this reduces the amount of milk they produce. Water shortage due to climate change is another significant challenge as dairy products are the third-largest food product category in terms of water footprint.[15] Leading ice cream companies are taking measures to mitigate these risks; Unilever[16], for example, is applying the Alliance for Water Stewardship (AWS) standard to recycle and reuse water in its ice cream factory in Türkiye.

Global warming also impacts production of other ice cream ingredients. For example, according to the International Union for the Conservation of Nature, vanilla crops are facing the highest risk of extinction due to rising temperatures exacerbated by climate change. Similarly, global cocoa production is threatened by climate change as, according to the International Centre for Tropical Agriculture, rising temperature in the tropical equatorial countries may significantly impact cocoa production suitability of the main-producing countries over coming years. To mitigate these risks, leading cocoa processing companies, such as Barry Callebaut, diversify their supply sources and develop sustainable agricultural practices, with a focus on ecosystem restoration, enhancing biodiversity and promoting agroforestry.[17]

Mislabelling and deceptive marketing practices

There is little differentiation across related products

Various food-related regulatory bodies around the world define ice cream in different ways. They generally provide guidelines or rules on the minimum amount of milk-fat and milk-solids that a product should contain – usually in the range of 10-20% – for it to be called an ice cream. However, issues related to producers misrepresenting ingredients, as well as using incorrect classification of ice cream and related products, have been reported. Other frozen desserts, which vary in their composition and production process (see figure 2), are also sometimes loosely labelled as ice cream by companies.

Competitive landscape has led to deceptive marketing practices

Due to growing competition, rising cost of ingredients and pressure to deliver differentiated products, numerous instances of mislabelling and misselling of ice cream have been reported across different geographies. This has resulted in a number of lawsuits against some of the leading global and regional ice cream companies. A large share of these lawsuits is reported in the US, which we think can be attributed to relatively stronger regulations and the consumer-protection legal framework in the country.

15 Philip Shine et al, A Global Review of Monitoring, Modeling, and Analyses of Water Demand in Dairy Farming, 2021
16 Unilever, Water Stewardship, 2023
17 Barry Callebaut | Annual Report 2021/22

2. Many types of frozen desserts add to consumer confusion

Product	Brief description
Non-dairy frozen desserts	Use plant-fat instead of milk-fat and milk-solids
Sorbet	Fruit juice or puree based; do not contain fat or milk solids-not-fat (MSNF)
Sherbet	Similar to Sorbet, but with small amount of fat or MSNF
Frozen yoghurt	Goes by its name – yoghurt is the main ingredient; it also comes as a mix of ice cream and yogurt
Water ice	Mix of fruit concentrates, flavours, colour and sugar; also comes with an ice cream core
Gelato	Similar to ice cream but usually contains less cream and air
Kulfi	Indian variant of ice cream; usually comprises slow-cooked, thick flavoured milk

Source: HSBC
Please note, there are numerous local versions across the world with different names but similar composition and production process

We highlight two broad areas related to this issue:

- **Misselling and misleading advertisement:** This includes cases of false and deceptive marketing of ice creams:
  - Passing off ice creams made up of *natural* products, while using synthetic flavours (e.g., vanilla)
  - Selling 'ice cream' made of *vegetable fat* derived from palm, corn, coconut or other sources, instead of milk-fat
  - False claims of using super-foods in *healthier* version of ice creams
  - *Frozen non-dairy desserts* marketed and sold as ice cream, claiming the product to be an ice cream.
- **Deceptive packaging:** This includes packaging with wrong or incomplete ingredient labelling, and/or using misleading imageries which do not correspond to the ingredient list.

Examples of lawsuits for mislabelling and deceptive packaging

A curious case of '*happy cows*': A lawsuit filed in 2018 against Ben & Jerry's, a leading American manufacturer of frozen desserts, stated that the company's claim of ice cream coming from 'happy cows' is misleading. The lawsuit cited that the company instead employs factory-style mass-production practices for its dairy operations, which do not align with company's claim of following basic norms of being a 'caring dairy farmer'.

'***Vanilla cases***': A number of lawsuits have been filed, particularly related to claims of misleading marketing, labelling and selling of 'vanilla' flavoured ice creams, mainly in the US. Unilever's Magnum ice cream, for instance, was the subject of a lawsuit in 2019, which claimed that it is flavoured by imitation vanilla though the company advertised it as 'vanilla' flavoured.

'***Healthy*' ice cream:** Last year, a case on the false and deceptive marketing of a 'healthy' version of an ice cream product was filed against Rebel Creamery, an ice cream manufacturing company in the US, claiming that the product actually contained high amounts of non-healthy saturated and trans-fat. The lawsuit further claimed that the company wrongly labelled the product as nutritious, with misleading statements and advertisement, and left out information related to the saturated and trans-fat compositions of the products.

Conclusion

In our view, investors should continue to scrutinise companies' commitments in the ice cream industry; future improvements should focus on raw materials stage, especially raw milk production, as well as vanilla and cocoa cultivation. Energy reduction during the refrigeration stage, plugging refrigerant leaks, correct labelling of ingredients, honest marketing practices and social impacts on workers in supply chains, are other potential areas of investor attention. Over time, investor input could, we think, help make ice cream more sustainably delicious.

Disclosure appendix

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