

Socio-economic Impacts of **Water Quality** on the **UK's Shellfish** **Aquaculture Industry**

December 2023



Shellfish
Association of Great Britain

Executive Summary

The UK shellfish industry is a historical part of the nation's economy, generating over £500 million annually. However, the shellfish aquaculture industry makes up just £15m of that figure. A strong shellfish aquaculture industry would contribute to the UK's food security, boosting sustainable and economic development.

This report explores the socio-economic challenges experienced by producers of oysters and mussels due to continuing poor water quality, which falls below legal standards. The issue of poor water quality causes a variety of problems, including diminished shellfish yields, heightened production costs, eroded consumer trust, and critical public and personal health implications. Addressing these concerns is imperative to not only sustain, but also enhance the resilience and growth of the UK's shellfish aquaculture.

A questionnaire was completed by members of the UK's shellfish aquaculture industry. The results from the questionnaire indicate that water quality leads to detrimental economic and social impacts. The impacts appear to be disproportionately felt by producers in England and Wales compared to their Scottish counterparts. Social and economic impacts can both be the direct result of poor water quality, or one can follow the other.

What this report clearly shows is that poor water quality costs our shellfish industry resources and causes stress, additionally, poor water quality erodes consumer confidence and impacts export potential impacting demand. Until the issue of water quality is addressed and resolved, the growth of UK's shellfish industry will continue to be unfairly constrained.

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Introduction

This socio-economic impact report details the consequences of poor water quality on the UK's shellfish industry. The report utilises feedback via questionnaire results completed by members of the shellfish industry across the UK, the questionnaire examined both the economic and social impact the UK's poor and deteriorating water quality.

In contrast to the increasing aquaculture production of mussels worldwide, production in the European Union (EU) has shown a decreasing trend over the last two decades¹. None more so than in the UK where our production is far lower than comparable EU member states.

1. About the Survey

The UK's shellfish industry, encompasses various species, and is part of a longstanding & important cultural heritage and economic driver for coastal communities. However, it is oyster and mussel producers who confront specific adversities when grappling with the consequences of poor water quality. The root causes, which often involve pollution, climate change, and environmental factors, have far-reaching repercussions on the industry's socio-economic fabric. Causes which are often inflicted by actors outside the shellfish industry but have damaging effects to members inside.

Over September and October 2023 members of the shellfish industry were asked to complete a short survey about their experience with water quality and its impact to their business. Fig.2. provides details of the experiences of the people who completed the questionnaire. More than half having spent over 20 years within the shellfish industry. The following segments will detail the impact of poor water quality to various socio-economic factors experienced by the shellfish industry.



Fig.1. Map showing completed questionnaires by nation states.

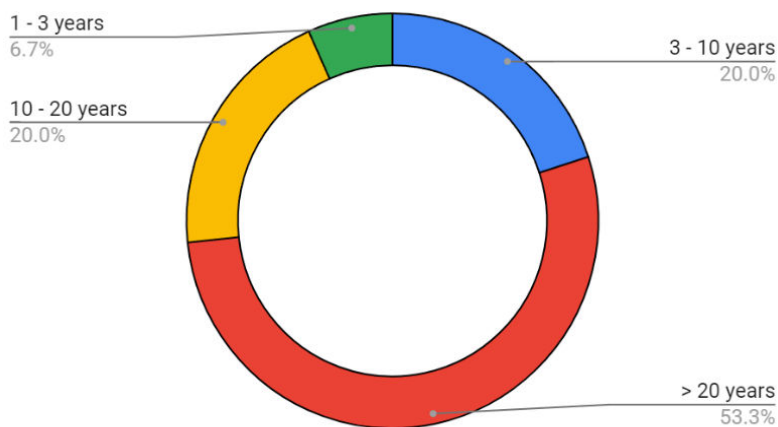


Fig.2. Number of years spent working in the shellfish industry.

2. Impact on Shellfish Production

- a. **Diminished Yields:** The precarious state of water quality directly affects the growth and well-being of shellfish. Filter feeding oysters and mussels depend on microorganisms present in the water as their primary food source. Pollution-infested waters disrupt this ecological balance, leading to diminished yields and compromised product quality.

“Improving water quality through better land management is essential for improving consumer safety and confidence, so that bivalve aquaculture can become a thriving industry in SW England and contribute significantly to UK food security and sustainable regional and economic development.”²

- b. **Elevated Mortality Rates:** Escalating pollution levels and fluctuating water temperatures exacerbate shellfish mortality rates and can result in production mortalities.

Pollutants and poor water quality can damage mussels and other shellfish. The filtering nature of mussels renders them vulnerable to two important but uncertain pollutants: heavy metals and plastics. Mussels accumulate a wide range of heavy metals in their tissue by filtering the water¹.

3. Economic Consequences

As water quality issues are out of the hands of producers, economic impacts experienced by producers are unavoidable and as this section shows can have long term and dramatic economic consequences.

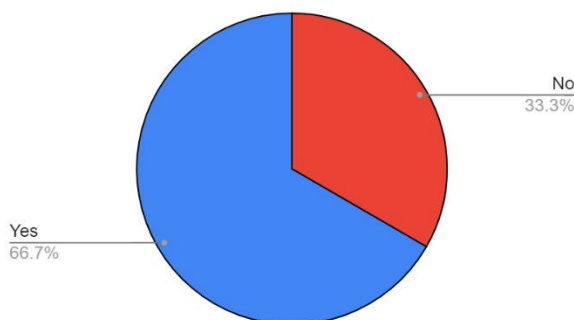


Fig.3. Number of responses indicating an increase in cost due to poor water quality.

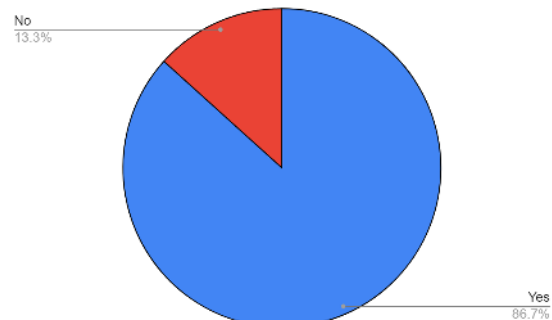


Fig.4. Number of responses that indicated if poor water quality has necessitated additional processes to ensure safety and quality of shellfish.

- a. **Capital Costs:** For shellfish producers to ensure their product is safe new depuration equipment and in some cases properties or facilities need to be purchased and/or made fit for purpose. Fig.4 shows how **86%** of producers indicated that additional costs were incurred due to poor water quality. Depuration tanks cost multiple thousands (**£1000 - £15,000**) for small scale producers while results from the questionnaire indicated a range in capital cost from **£100,000 to £10m** for bulk producers. **20%** of producers indicated that additional capital investments to depurate their shellfish were simply not feasible due to the large quantity of shellfish produced, with no facility currently in existence in the UK. The impact of this leaves bulk producers unable to depurate their produce leading to closures.



Photos showing shellfish depuration facilities in the UK

- b. **Escalating Production Costs:** To mitigate the effects of poor water quality, producers must allocate significant resources towards upgrading filtration systems and implementing water treatment technologies. This translates into a mounting burden of production costs for lower classification of waters. Questionnaire results reported a range of costs from **£100 to over a £1000 a month**. Others reported that **2 pence per shell** is charged by the buyer in order to depurate due to a lower classification of shellfish waters.

Various producers only depurate during months of high rain and resulting poor water quality, again leading to increased production costs. Some indicated an estimate cost to depurate shellfish at **30 – 50 pence per kilo**, with production rates at 100 tonnes per week that would result in unfeasible costs of **£40,000 per week** (plus requiring a depuration facility large enough to hold 200 tonnes). Smaller scale producers indicated cost of **£1000 a month**.

As water quality continues to be unsuitable many producers indicated a requirement to undertake microbial testing more frequently to ensure shellfish quality. The testing can often be expensive, time consuming and stressful. Producers indicated laboratory costs in the region of **£2000** per year.

All additional production costs need to be funded to ensure the safety and quality of the shellfish. A proportion of the cost is absorbed by the business leading to a reduction in investment/growth potential while a proportion is passed to the consumer resulting in high prices and reduced demand. The cost unfairly correlates with water quality, through no fault of their own the shellfish aquaculture company is paying the price of the pollution and the poor water quality.

- c. **Revenue Erosion:** A reduction in shellfish quality and/or yields translates into a corresponding decline in revenues for oyster and mussel producers. Some producers reported an intentional reduction in production to ensure tank loading wasn't too high at times of poor water quality. The economic ramifications of this loss ripple outward, affecting both the livelihoods of the producers and the local economies with the shellfish farming industry.

33% of completed surveys indicated that they had experienced losses (shellfish mortality or loss stock) due to issues with water quality, a shockingly high proportion (one third) of producers surveyed have uncompensated losses for their business, due to poor water quality. Losses are experienced when depurating shellfish, when stock is returned and/or when beds are closed due to water quality issues.

Additionally, **73%** of completed surveys indicated that their beds were closed either temporarily or permanently due to poor water quality. When a shellfish bed is closed due to poor water quality, the producers require at least one satisfactory water quality test result before the bed can reopen. The closures have a “**devastating**” and “**catastrophic**” impact on their business due to severe economic pressures. Some indicated a cost of **£8,000** per month while others reported yearly costs of **£300,000**.

33% **REPORTED
LOSSES DUE TO
POOR WATER QUALITY**

“When beds are closed due to classification issues it has a near catastrophic impact on my business” English shellfish producer

4. Impact on Export Markets

- a. **Water Quality & Brexit:** Due to relatively low consumer demand in the UK, directly attributable to poor water quality, many large-scale producers rely on European export markets. Since Brexit, the EU has required all imports from the UK to be 'fit for consumption' (A class, or deperated B class). Poor water quality has led to some beds in the country slipping into B class, the combination of poor water quality and Brexit have resulted in some of the UKs largest shellfish producers (whom are unable to deperate) unable to export.

"We have been living on a knife edge" one shellfish business owner remarked. Bulk shellfish businesses are reliant on European markets due to low domestic demand; therefore, they are dependent on a class A waters. Producers indicated extremely severe economic losses due to the inability to export plus they remarked on the personal stress experienced when awaiting test results. For businesses (and people) to live without certainty or stability makes it nearly impossible to plan or invest in the future.

- b. **Erosion of International Competitiveness:** Poor water quality casts a shadow of doubt over the reputation of UK shellfish products. This loss of consumer trust often leads to reduced export demand, impeding access to export markets. Producers who completed the survey remarked that their merchant customers were asking for additional testing indicating a loss in confidence leading to increase production costs and lower profits.

- c. **Stringent Regulatory Hurdles:** International trade regulations necessitate stringent quality and safety standards for shellfish products. In cases of subpar water quality, compliance with these exacting standards becomes an arduous task. Some producers have moved away from export markets due to the complex, time consuming and expensive paperwork. The worse water quality remains the more restrictive overcoming regulatory hurdles becomes. In all cases restrictions lead to decreased economic flexibility and reduction in available time.

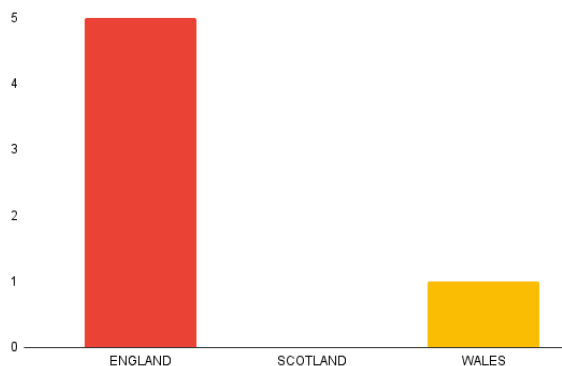


Fig.5. Indication of results when asked if poor water quality has impacted businesses access to export markets

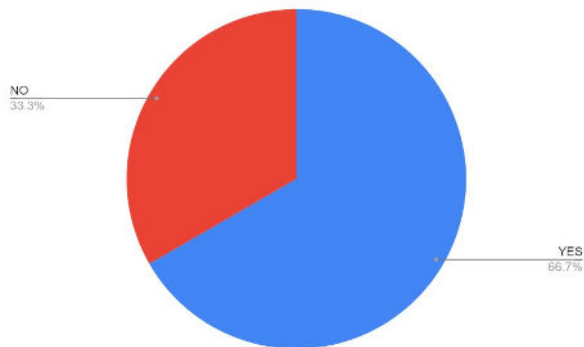


Fig.6. Percentage of completed survey (Eng & Wales only) which indicated their access to export markets had been impacted due to poor water quality.

5. Social Implications

- a. **Consumer Health Risks:** Contaminated shellfish carry a significant public health risk, potentially leading to foodborne illnesses. Such incidents not only jeopardize the well-being of consumers but also inflict irrevocable harm on the industry's reputation. Shellfish producers around the world do everything they can to ensure their shellfish is safe to eat and UK's shellfish producers are no different, however this is made increasingly more difficult due to unacceptable water quality.
- b. **Consumer Confidence:** As figure 7 demonstrates the vast majority of producers feel that the perception of poor water quality has affected the consumer confidence in their products. Some had even observed a direct link between reports of poor water quality in the media and a resulting reduction of orders. Consumers often asking, "are these safe to eat?" or similar comments following media reporting, while wholesalers ask for water quality results and some restaurants have taken shellfish products off their menu at poor water quality periods.

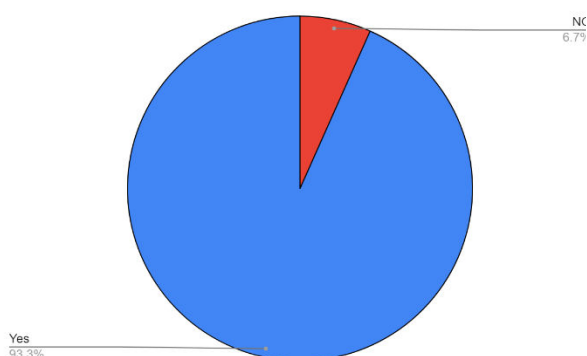


Fig.7. Do you think the perception of poor water quality affected consumer confidence in the shellfish industry?

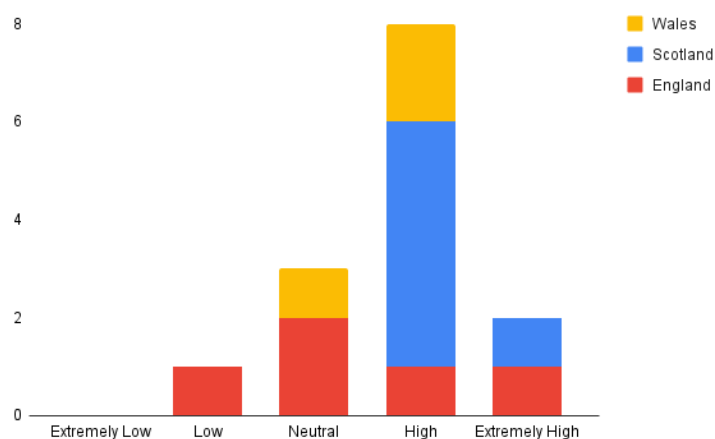


Fig.8. If yes, how would you rate the degree of impact on consumer confidence?

- c. **Public Perception:** Alongside the survey, SAGB has been conducting a social media campaign with the aim to promote UK's shellfish industry and products to consumers. Unsurprisingly, the comments shed light on what the UK public felt when it comes to UK shellfish and its relationship with water quality. Table 1 provides a small example of the comments which were recorded, clearly showing a proportion of the public have concerns over water quality and UK's shellfish. Out of 100 random comments 15 (15%) were remarking on the risks associated with UK shellfish and poor water quality, with water quality ranking in the top three of issues raised in the comments. Whether UK water quality is declining or not, the huge media focus on water pollution leads to the consumer perception that water quality, and thus shellfish quality, is declining. We need government to move quickly to force water

companies to meet their statutory obligations and deliver improvements. For as we have seen over the decades since privatisation water companies have no intention of taking action themselves.

In a recent social media campaign run by the SAGB there were three clear barriers identified to people buying and consuming shellfish. Two of which were the perceived poor quality of the shellfish due to the pollution from water companies and the affordability of shellfish. These are both as a direct result of pollution and poor water quality. This demonstrates quite clearly why the shellfish aquaculture industry in the UK is failing, and it is poor water quality that is responsible.

1.	"I'd love to try. On a serious note though, all the sewage that the government have allowed to be pumped into our waters, are British oysters still safe to eat?"
2.	"Thanks, this is helpful to know as I love shellfish but I'm very angry at the pollution of our waters."
3.	"E-Coli nailed on when eating U.K. shellfish."
4.	"YUK, how many times have we heard chefs say "raw shellfish are a health risk". Then they say "chuck a few of these down with a dash of lemon". This is after they have been feeding on all that effluent the water companies dump in the sea off of our coast"
5.	"Bit worried with all the untreated raw sewage the [curse removed] water companies are pumping out and a greedy corrupt sitting government enabling that"
6.	"Shame about the waters in which they grow. I really used to love them, but British oysters no longer seem so palatable."
7.	"Until the raw sewage stops being poured into almost all of our coastal waters I'm afraid I will not be eating any native oysters."

Table.1. **A small selection of comments made by the public on social media posts created by the Shellfish Association of Great Britain (SAGB) (2023).**

- d. **Producers stress & well-being:** Aside for the extreme economic and consumer consequences of poor water quality on the UK shellfish industry, this report aimed to understand some of the impact to shellfish farmers and producers. All shellfish producers aim to provide the best quality shellfish, undertaking additional practices and procedures to ensure their product is safe for consumption. Water quality is out of their hands; however, they have to pay the price both financially and with an additional burden of stress.

As with various other factors, this burden of stress appears to be felt more commonly and intensely in England and Wales, with **100% (9/9)** of respective producers indicating they experience additional stress due to poor water quality. Compared to **66% (4/6)** of Scottish producers. Many reported that the instability of their business can impact stress of the producers throughout their entire workforce plus overspilling to their families. Others remarked on the lack of support from government in terms of holding water companies to account or by providing support for the shellfish industry impacted their wellbeing.

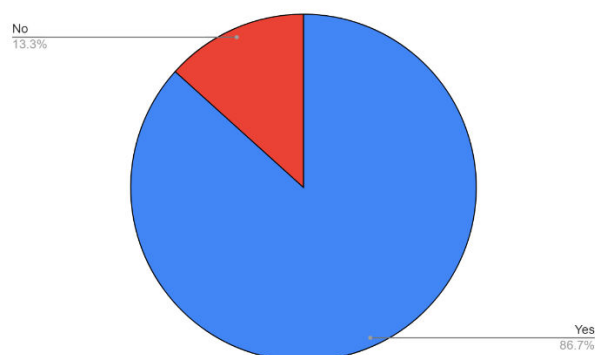


Fig.9. Question posed to shellfish producers "Do you experience additional stress or pressure to ensure the safety of your product in relation to water quality?"

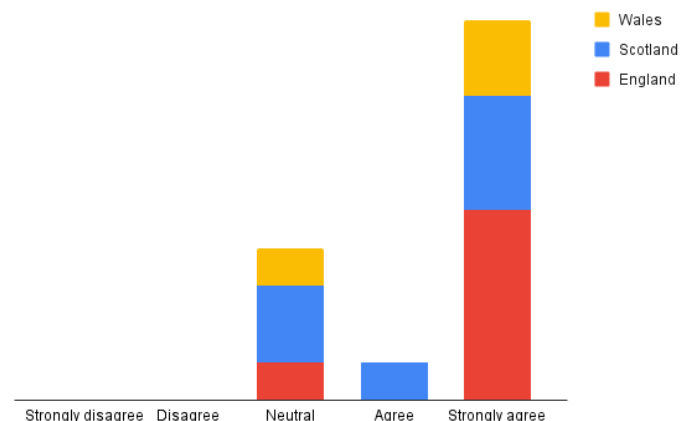


Fig.10. Question posed to shellfish producers "Do you agree or disagree that recent poor water quality has led to an increase in stress/pressure experienced?"

The key areas which were highlighted to illicit stress for producers were:

- Ensuring their products are safe, especially at periods of suspected poor water quality (high rainfall etc.)
- Financial implications of either loss of stock, change in shellfish water classification, closure of beds or recall of produce
- Reputational risk of providing a product which leads to illness
- Business instability/resilience, in particular when exporting produce
- Ineffective regulation & inaccurate testing regimes

- e. **Loss of industry confidence resulting in less young/new farmers:** The issue of water quality in the UK is often in the mainstream media and appears to be declining to the general public. The negative attention in the media, lack of stability plus a lack of substantial support from the government result in a lack of young farmers entering the industry.

In the current climate it is difficult to imagine a strong, stable, and prosperous future for the UK's shellfish industry resulting in very few incomers. A change is required to attract in new farmers and to enable the future of UK's shellfish industry.

- f. **Loss of trust or faith:** A recurring theme of the questionnaire was the producer's loss in trust of water companies or faith in government agencies. A lack of transparency or honesty from their respective water companies were often highlighted however a proportion of shellfish producers had no contact with their water company.

7. Recommendations

- a. **Water Quality Enhancement:** Robust investments in water quality improvement initiatives are imperative, encompassing stricter pollution control measures, sustainable farming practices, and comprehensive research into climate change adaptation. Stopping pollution at the source via investment plus improving real time data from water companies would help the aquaculture industry be more informed and the product quality be more predictable and safer.
- b. **“Polluter Pays Principle” Financial support for the shellfish industry:** Support from water companies (or other polluters) should be provided to the shellfish industry to help mitigate the negative impacts imposed upon shellfish producers. The burden of cost from pollution is currently unjustly falling onto the shellfish producers, this should be examined and readjusted. Financial support would provide producers with a chance to mitigate against pollution, improve testing regimes, increase the quality and quantity of depuration facilities, and allow businesses to grow. In other European countries financial support is provided to shellfish producers when pollution affects their businesses.
- c. **Testing Research and Development:** The industry's future hinges on innovative solutions such as the development of more reliable, faster, and cheaper microbial testing techniques. Government agencies could be supporting the shellfish industry by setting up government sanctioned facilities or methods to enable more efficient testing. Furthermore, research and development initiatives would help the aquaculture industry become more resilient and stable.
- d. **Consumer Education:** Raising consumer awareness regarding the UKs shellfish aquaculture industry is important to boost consumer confidence and demand. Encouraging support for sustainable practices can ultimately bolster the industry's resilience and improve domestic demand. It is vital that support from government is available for industry to promote consumption of shellfish and counter the public perception that sewage in the water makes shellfish unsafe to eat.

8. Conclusion

The multiple socio-economic repercussions of unacceptable water quality on the UK shellfish industry, particularly on oyster and mussel producers, are severe and multifaceted. These consequences encompass reduced yields, increased production costs, diminished revenue streams, potential public health hazards, and an additional burden of stress.

The results from the questionnaire highlight a high level of impact to shellfish producers and their businesses. Additionally, stringent and often unreliable produce testing coupled with poor water quality restricts the producer's ability to plan, invest and grow.

A recent progression (1st November 2023) of section 19 of the Environment Act³ means the 'polluter pays principle' is now in force, the information in this report should add strength to the use of this principle. As this report demonstrates the unfair and unsolicited impact of poor water quality on the shellfish industry. If the polluter pays principle is adopted properly the repercussions to the shellfish industry from polluters would help to balance the negative impacts. Funding could be used to improve depuration facilities, improve testing regimes, research and development, exploring other markets and more.

“The Polluter Pays Principle means that, where possible, the costs of pollution should be borne by those causing it, rather than the person who suffers the effects of the resulting environmental damage, or the wider community.”³

The burden of stress when operating a business which could be shut down or heavily restricted through no fault of their own is a heavy burden to carry. Additionally, the impact of this stress is felt by business owners, workers and their families.

The restricted access to export markets has left our largest shellfish producers unable to invest, plan or grow into the future. We hope this report will encourage the facilitation of negotiations with European markets to ease the trade restrictions imposed.

This report highlights the urgent need for collaborative efforts from government, industry stakeholders, and the public to address water quality issues and secure the future of the UK shellfish industry. **This is a call to action** for sustainable practices, innovation, and awareness to overcome these challenges.

Water quality issues have always impacted the shellfish producers negatively. This has resulted directly in the stagnation of the industry over decades. An industry which produces safe and healthy protein with a minimal, some would even say positive, environmental impact and contributes directly to the food safety of our nation should be valued and encouraged.

There is limited land available in our country to be farmed to produce more food but there is a huge amount of coastline which we could exploit to make our country more secure in terms of food safety. The expansion of the industry simply will not happen until pollution of our waters is brought under control. When we do that running a shellfish aquaculture business will become an attractive proposition instead of the uncertain, stressful reality of today. **We must support our shellfish growers whilst addressing the pollution or there will not be an industry left at all.**

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Thanks to all that took part in the survey. If you have additional comments, feedback or information regarding the report please get in touch.

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