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Want to save the planet? Tuck in to some jellyfish and chips, squid sausages and algae burgers...

By Simon Osborne

The year is 2050 and you are hungry. Your robo-cooker is on the blink and the pizza delivery pilot has dinged a wing on his sky-ped. There's only one thing for it – a trip to the fish shop. Except that it isn't a fish shop any more. There are chips, but the only cod or plaice to be seen appears in photos on the walls – memories of the meals of yore. The name above the counter tells you all you need to know: "Squid's In". You order a large humboldt and chips with a side order of jellyfish rings.

It's a vision of the future that may sound far-fetched, but there's a rising tide of thought in marine conservation and the food industry saying that, if we don't change the way we fish or take steps to stop pollution and climate change, it could be the end of the line for many fish counter favourites. In their place, we'll be eating the more exotic and less savoury species that are already swimming into their habitats.

The problems with wild fish are most comprehensively exposed in the recent "Silent Seas" report by the Marine Conservation Society. It's a depressing read, especially if you're a sturgeon. It reports that, last year, only eight out of a total of 47 stocks of wild fish were known to be in a healthy state. Species at risk include the Atlantic cod, the Atlantic halibut, which is "critically endangered", and the white skate.

Causes include pollution – more than 30 per cent of our estuaries and 15 per cent of coastal waters are at risk from nutrients, pesticides and heavy metals – and climate change. But perhaps the biggest culprit is overfishing. According to the UN's Food and Agriculture Organisation (FAO), three quarters of the world's fish stocks are exploited or recovering from depletion. In Europe, the European Commission considers that 88 per cent of stocks are overfished.

The picture gets worse the wider you cast your net. Take the Benguela current, a massive expanse of the Indian Ocean off southern Africa. As one of the world's most fruitful fisheries, it teems with fish. Or at least it used to – one recent study found that another species has moved in and now makes up three times the biomass of anchovies, sardines, mackerel and hake combined. The impostor: the jellyfish. Rampant overfishing means that, without competition, jellyfish are making the most of exclusive access to the nutrients that make the waters so fertile.

Opportunistic squid are on the rise, too. Without tuna, marlin or swordfish to feed on them, species like the Humboldt, which now thrives in the East Pacific, are multiplying. Off the coast of California, they are now threatening once abundant hake stocks.

In a recently published census of marine life, Canadian scientists predicted that, if the rate of collapse of fish species continues, none of the fish we now pile on our plates will be around in 2050. Which begs the question, what will we eat?

Perhaps Japan has the answer. In the past few years, vast armadas of slimy, six-foot, Nomura jellyfish have regularly started terrorising native fish by crushing them in nets or poisoning them with their menacing tentacles. The influx became a crisis when fishermen in some coastal communities watched their income fall by 80 per cent. But in one fishing town, called Obama, enterprising locals came up with a solution: eat the jellyfish. Cookery classes taught people how to turn the gelatinous beasts into sushi and other tasty snacks.

Some think we'll soon be doing the same. In the Silent Seas report, Dr Daniel Pauly at the Fisheries Centre at the University of British Columbia says: "When I first began talking about jellyfish burgers in the late 1990s, I did it as sort of an absurd metaphor. I had no idea it would become a reality."

But do we have a taste for jellyfish? Squid at least is known for its culinary qualities – calamari are a staple in the Mediterranean and sell well in British restaurants. They are also high in protein, low in fat and packed full of vitamins. Even so, the squid section of the average supermarket fish aisle isn't exactly overflowing, and there's no nice Italian word for jellyfish.

There is, however, a Chinese word for jellyfish: "Hai Zhe". Chinese seafood lovers have been eating the things for more than 1,000 years. While I was living in the city of Ningbo, a well known centre for seafood not far from Shanghai, I was served jellyfish at a wedding banquet. To me, eating it was like chomping through a knee joint, but perhaps it was a bad batch.

"I love jellyfish," says Ching-He Huang, the Taiwan-born cook and presenter of last year's BBC2 series, Chinese Food Made Easy. "I was just telling my friends the other day that we should eat more of it. My grandmother used to make it stir-fried with beef and vegetables and I often cook it. It doesn't taste of anything but it's delicious because of its texture – in Mandarin we call it "ko-gan" or "mouth-fee" – rather than its flavour. You can slice it thinly and marinate it in a sesame soy vinegar dressing with sliced cucumber, bean sprouts and shredded chicken and have it as a cold salad garnished with toasted sesame seeds. Or you can incorporate it into a spicy Thai pomelo and prawn salad."

It's almost enough to make one's mouth water, but there are some in the industry that say British tastes will have to undergo a radical transformation if jellyfish is going to find a place on our shopping lists. "People here don't want to go for unfamiliar things," says Philip MacMullen, head of environment at Seafish, which represents the British seafood industry. "Many years ago the FAO had a plan to turn something called fish silage, which would be like fish offal, into sausages to alleviate world starvation. But nobody would eat them. I have no expectation that jellyfish is going to make any impact."

Steve Cadwallader is a consultant food technologist who advises retailers on which products will sell. He says squid is proving popular but even that is difficult to market "because the British cook has forgotten how to prepare seafood unless it's battered or breadcrumbed. We're still a very traditional country. What sells is haddock, plaice and prawns. With everything else it's an uphill battle." So what about jellyfish? "No chance."

But what if we were forced to seek alternatives? After all, our appetite for fish shows no signs of diminishing – UN estimates show that in 2007 fish provided 20 per cent of our intake of animal proteins. In Britain each of us consumes 20 kilos of fish every year and demand is growing in developing countries. If jellyfish or squid becomes the catch of the future, we may have to look to technology to make it palatable. Last month, scientists in Mexico developed a way to turn the muscle of jumbo squid into the "world's first seafood frankfurter". The new product scored only a "liked slightly" in taste tests but scientists admitted it was early days for the squid sausage.

It's early days, too, for marine plant life that some say may also find a place on our dinner tables. The depletion of fish stocks is also leading to huge blooms of phytoplankton. Seafood fans of the future wouldn't be the first to eat the plant. The Aztecs made special cakes out of algae harvested from Lake Texcoco, which apparently tasted like cheese. Kelp forests are also booming. Huang says kelp and other seaweeds are "delicious braised in soy and star anise with pork belly and boiled eggs".

But some do doubt whether the future really includes squid sausages, jellyfish rings or algae cakes. Critics point out that the unpredictable population and high costs involved in processing jellyfish or plankton, while squid populations are notoriously sensitive to changes in conditions and don't do well under pressure. MacMullen also thinks predictions of the demise of traditional species by 2050 are overblown: "Climate change has been and will continue to be the biggest threat for many species but nothing is in dire straits." Even if the "Squid's In" scenario is as fanciful as robo-cookers and sky-peds, it seems certain that if things don't change, the fish shop of the future will be a very different beast.

Tomorrow's catch: Foods of the future

Jellyfish

Likened to "really tough cucumber" or "cartilage" but popular in parts of Asia, where it's usually sliced thinly, marinated and served cold in salads.

High in potassium and copper and a good source of selenium and iron, though low in protein.

Squid

A staple in Mediterranean countries and popular in British restaurants, usually when covered in batter and deep fried, but a slow-seller in supermarkets.

Low in fat and a good source of proteins, vitamins and zinc, but high in cholesterol.

Kelp

Popular in Japan as a savoury snack and used to flavour stews and broths or sprinkled over dishes as a savoury garnish but not popular here – yet.

High in fibre and full of vitamins as well as minerals – but also high in sodium.

Plankton

The Aztecs turned it into a cheese-like "algae cake" and today is eaten by people living in several counties in central Africa, where it is harvested from Lake Chad.

Packed with omega-3 fatty acids and minerals but difficult to harvest in bulk.



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