Seaweeds high in guluronate inhibit fat absorption

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(Medical Xpress)—Scientists at Newcastle University have identified the seaweeds which are most effective at preventing us from absorbing fat, opening up exciting possibilities for making everyday foods healthier.

Alginates are already used in foods, such as stabilisers in jam and to maintain the head on a pint of beer. However, their potential as a food supplement which prevents us absorbing fat is now being explored.

In the Western diet, 40% of calories come from fat and while we need some fat in our diet, many of us eat too much. 95 – 100% of the fat we eat is digested by lipase, an enzyme that the body uses to break down fats. If we can reduce the amount digested, we reduce the amount absorbed.

New research published today in *Food Chemistry* and funded by BBSRC has identified the chemical properties of alginates which prevent fat from being digested by our bodies and this has allowed scientists to produce a league table of the most effective seaweeds. If added to everyday foods these seaweeds could prevent us absorbing much of the fat from our diets.

Alginates

Professor Jeff Pearson of Newcastle University's Institute for Cell and Molecular Biosciences said: "We have already added alginate to bread and initial taste tests have been extremely encouraging. Now the next step is to carry out clinical trials to find out how effective they are when eaten as part of a normal diet."

This builds on previous work by the team which found that dietary fibre, Alginate, a natural fibre found in sea kelp and one of the world's largest commercially-used seaweeds, could reduce the amount of fat available for absorption by the body by around 75 per cent. This is better than most anti-obesity treatments currently available over the counter.

Alginates are made up of long chains of sugars, Guluronate and Mannuronate. Tested in an inhibition assay, using olive oil as a substrate, scientists identified that alginates containing more Guluronate were more effective at stopping the digestion of fat.

Dr Matthew Wilcox, from Newcastle University, added: "What we have shown is that the seaweeds with a high level of guluronate stop the body breaking down and absorbing fat. As they are already used in the food industry in small amounts, we are looking at increasing their levels in foods which could reduce the amount of fat that we get which could help in weight management."

Fat absorption

From the research, the seaweeds which contain the right alginate can be listed from most (1) to least (3) effective at preventing the digestion of fat:

1. Tangle or Cuvie, Laminarea hyperborea a brown sea kelp G= 0.49
2. Bladderwrack, Lessonia nigrescens, the giant grey weed, is a kelp species G = 0.45
3. Bull kelp, Durvillea potatororum a brown algae G= 0.35

The next step for the team is to test the different seaweeds in a model gut and then to recruit volunteers to study whether the effects they have modelled in the lab can be reproduced in real people, and whether such foods are truly acceptable in a normal diet.

Provided by Newcastle University