

Helping Your Patients Feel Full on Less. The Latest Evidence. Highlights from the BNF Conference on Satiety

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Hunger is a major obstacle to weight loss. Satiety and satiation are key players in helping people feel full on less calories according to the latest evidence presented at the BNF's conference on Satiety in June 2009. Chaired by Professor John Blundell, we were in for a treat with many expert speakers allowing us a peek into as yet unpublished data.

Bridget Benelam, author of the BNF Briefing Paper – Satiating, satiety and their effects on eating behaviour¹ provided an overview of the evidence. The BNF has also produced resources to help educate patients on how to select appropriate portions of foods with different energy densities². **Professor Steve Bloom, Imperial College London** reviewed **satiety signalling systems**. Satiety involves a cascade of signals to the brain by a variety of hormones. Leptin, produced by fat cells, is no longer seen as a regulator for weight control following studies demonstrating little impact on weight loss in obese individuals injected with the hormone³. Blocking the action of the hormone ghrelin, which is responsible for increasing appetite and food intake, has also shown little impact in obese individuals⁴. Current obesity drugs target the MC4 receptor, of which just 0.5% is responsible for appetite. The resulting side effects make them inefficient for long term use.

Professor Bloom advocates bariatric surgery as the most effective weight loss regimen. Recommended⁵ for the morbidly obese who have been unable to lose weight any other way, surgery can involve either banding to reduce stomach size (restrictive), bypass of the small intestine to reduce nutrient absorption (malabsorptive), or a combination of both. Although expensive with a 1 in 3 mortality rate from surgery and associated complications, when successful, risk of cancer is halved and in many, diabetes cured.

Bariatric surgery causes appetite to be switched off continually as a result of elevated levels of the satiety hormone peptide YY (PYY). Thin people also exhibit elevated PYY after a meal compared to the overweight and obese. Additionally, both obese and lean individuals injected with PYY display a reduced appetite⁶ and ghrelin is switched off. PYY is currently being developed as a therapeutic drug treatment.

Dr Alex Johnstone, University of Aberdeen presented on the positive effect of **protein on appetite control**⁷. Popular high protein diets have demonstrated an impact on short term weight loss. Protein is the most satiating of all macronutrients whether consumed with low or moderate carbohydrate intakes⁸. However, it is still unclear as to the optimum level or type of protein that needs to be consumed.

Professor Rob Welch, University of Ulster discussed the role of **whole foods with intact fibre on satiety**. Whole foods are more satiating than puree or no fibre juice equivalents. Whole foods take longer to consume and have an intact cellular structure, both indicated as important for increased satiation⁹.

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The volume of food consumed is also important for satiety. A preload meal which has been bulked with air or water to increase its volume will increase satiety leading to a reduced consumption at a subsequent meal.

Dr Barbara Rolls, Pennsylvania State University spoke on the effect of **energy density (ED) on satiation and satiety**. ED is the measure of energy contained per weight of food and expressed as calories/grams. Fat and alcohol have high ED's, 9kcal/g and 7kcal/g respectively, compared to 4kcal/g for carbohydrate and protein. Lower ED foods and meals have a lower associated calorie intake. ED can be lowered with the addition of water, air or use of naturally low ED foods like fruit and vegetables¹⁰. When food looks bigger, sensory perception concludes that less is needed to be eaten to reach satiety¹¹. Lowering ED of a meal by increasing vegetable content can reduce calorie intake by 30% without affecting satiety¹².

Overall, dieters find it easier to follow a low ED diet than a low fat diet because it causes less hunger¹². People can eat as much as they like until satiation yet still consume less calories. However, low ED foods can be expensive and industry should be encouraged to modify foods to ensure affordability.

As **palatability** increases so does intake according to **Professor Martin Yeomans, University of Sussex** who expounded on the currently accepted 'hedonic' theory that palatability is independent of need. In other words, when we are offered a second course, we will consume all of it *if* it is a food we like *even* if full from a first course, whilst we would refuse seconds or eat less of a food that is marginally acceptable or not liked.

We get satiated faster from 'bland' than 'palatable' foods. Palatable foods induce hunger resulting in an increased intake as well as making us think we're hungry for longer, thereby causing a prolonged period of intake¹³.

Studies have shown that palatability can be learned, which is important as it means that preference can be altered to healthier foods!

Our **expectation of food** affects both satiation and satiety as explained by **Dr Jeff Brunstrom** from the **University of Bristol**. The quantity of food eaten depends on the quantity of food present on a plate. What we place on our plate will depend on:-

- a) **expected satiation** - how much we expect we need to eat to be full **and**
- b) **expected satiety** - how long we expect a certain food to keep us full after a meal. The more variety of foods on the plate also leads to an increased intake¹⁴. Individuals often have an expectation that is quite different to reality in terms of food calorie content. When faced with familiar foods, individuals have a more realistic expectation of their calorie content and how long they would satisfy them for¹⁵. However, with multiple manufacturers producing like foods with varied energy content, this has been made more difficult for consumers. Experiments have shown that expected satiation and satiety can be learnt over time.

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Dr James Stubbs, Slimming World presented their healthy eating philosophy and gave three key reasons why people fall off the 'slimming' wagon:

- hunger
- goal weight achieved
- unhappy with restricted dietary intake

He also discussed the three energy and weight loss facts known as the 'energy gaps';

1) Weight creeps up through life in non dieters as they have an 100kcal difference between their dietary intake and their energy expenditure.

2) Overweight people need to eat 250 – 500kcal less a day for a sustainable weight loss of 0.5 to 1kg a week.

3) To counter the law of return, where the more and quicker the weight loss is, the quicker it returns, after dieting, dieters have to eat 300-600kcal a day less than they did before their diet.

The final speaker, **Dr. Jason Halford** from the University of Liverpool, focused on the way foods with promises of **health or weight loss benefits** are marketed and how they influence consumers choice. Such foods are definitely needed by consumers, however, claims and promises are sometimes based on little scientific fact. The new EU nutrition and health claim regulations will make it more difficult for manufacturers to make false claims.

On this note the day came to a very satisfying close with delegates having much to ponder. For those short on time we have pulled together a list of the top tips for patients;

- **Familiarise** patients with foods they eat often – this increases their understanding on how much food they need to put on their plate to feel full.
- Serve **smaller portions** – people eat more when presented with larger portions. Variety and number of meal courses also lead to increased consumption.
- Company and other **distractions** delay onset of satisfaction, leading to increased intake.
- High protein, moderate carbohydrate diets suppresses appetite and is useful for short term weight loss.
- Diets with very low and **low energy density** foods like fruit, vegetables, wholegrain and legumes will help with long term weight loss and maintenance.
- **Bulking up** meals with water or air, eg soup or stews reduces overall calorie intake of meals, whilst drinking a glass of water does not¹⁶.
- Eating high fibre **foods in their whole** state is more filling than pureed or liquid varieties.
- **Alcohol** is high in calories and stimulates appetite.

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- **Palatability** is important, and healthy eating preferences can be learned to be the preferred option over time.

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