



## Dairy Council for Northern Ireland Nutrition Lecture 2012

### **'New insights into dietary aspects of energy balance and obesity'**

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It is now widely recognised that obesity is becoming the most important nutrition related contributor to ill-health in the developed world. In addition, increasing rates of obesity prevalence in transition economies mean that overnutrition is more prevalent than undernutrition in the world.

The development of obesity can only occur when the amount of energy consumed in food and drinks exceeds the amount used up in metabolism (both at rest and during activity) over an extended period of time. This balancing of energy intake and energy expenditure is more difficult if the diet is rich in high fat, energy dense foods, or if there is a large consumption of drinks which also contain energy (e.g. soft drinks, fruit juice, alcoholic drinks). In these situations it is easy to consume more energy than needed to meet requirements, resulting in weight gain. Other factors which are likely to lead to over-consumption of energy include irregular, or chaotic, meal patterns and an increase in the portion sizes of meals offered to people. Recent research of ours has shown that a chaotic eating pattern, in which a different number of meals or snacks are consumed every day, leads to an increase in energy intake and an alteration in metabolism such that blood lipid levels rise and insulin resistance occurs. In addition, there is less stimulation of energy expenditure after food intake. Other research has shown that overweight children will self-select larger meals than normal weight children when food is freely available which is consistent with other research showing increased portion sizes are a risk factor for weight gain.

There is increased interest in food components which might help people to limit their energy intake and thus prevent weight gain or maintain weight lost during a period of dieting. Recent studies have shown beneficial effects of an increased dietary protein content, especially when combined with carbohydrate foods which have a low glycaemic index (i.e. they lead to a smaller rise in blood glucose when digested and absorbed into the body). A recent European, multi-centre study showed that when people took part in a weight loss programme involving consumption of a low calorie diet for 8 weeks, it was much easier to then maintain the weight loss when they then consumed a diet higher in protein and these low glycaemic index foods. This occurred even though these foods were freely available and not part of a restricted dietary plan. Part of this effect is likely to be due to protein being more satiating than fat or carbohydrate, such that foods rich in protein are more filling, leading to a longer time interval before the subsequent meal, or to the consumption of a smaller subsequent meal. We have recently demonstrated that consumption of mid-morning snacks with a high protein and soluble fibre content is associated with a reduced food intake at lunchtime and later in the day. This effect was sustained for a period of two weeks when the protein/fibre snack was consumed on a daily basis.

There is also growing interest in the possibility that dairy foods, either due to the calcium or the protein content, may have potentially beneficial effects to help limit energy intake and possibly also enhance energy utilisation.