

Eggs and Satiety

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Introduction

Eggs have long been acknowledged as a healthy food, but studies now point towards benefits for weight management, most recently from a trial presented at this year's European Congress of Obesity. But, what makes eggs useful for controlling weight, and is the evidence sufficiently strong for dietitians to make recommendations to patients?

Nutrition

An average egg contains just 78 kcal, but protein is high at 6.5g representing 13% of an adult's daily requirement. According to labelling regulations^[ii], eggs qualify as a 'source of' vitamin A, folate, choline, phosphorus and selenium, and 'rich in' vitamin D, riboflavin, vitamin B12, biotin and iodine. The high vitamin D content of eggs is noteworthy given current interest in vitamin D insufficiency in the UK, and links with poor bone health and chronic disease^[iii].

Cholesterol in eggs has received unfavourable attention in the past but it is now accepted by heart charities and the Department of Health that dietary cholesterol plays a minor role in cardiovascular disease^[iv]. For this reason, previous limits on egg consumption have been removed and replaced by advice targeted at saturated fat.

Satiety and weight management

Certain nutrients, such as protein, fibre, novel oils and non-digestible carbohydrates, are believed to be useful for weight management^[v] because of their effects on satiety (defined as a feeling of fullness after eating). An enhanced and prolonged satiety may limit food intake at later meals thus contributing to a reduction in overall daily energy intake.

Satiety is estimated by asking people to rate on a 10-point visual analogue scale how hungry and full they feel throughout the day. It is now good practice for studies to include a measure of energy intake, for example by using one or more test meals where participants can eat *ad libitum*^[vi]. Diet diaries are also useful as they show whether or not energy compensation occurs later in the day.

The effects of protein on satiety, energy intake and weight loss have been investigated in many studies^{[vii],[viii]}. The mechanisms may relate to changes in gut hormones, e.g. CCK, GLP-1 and PYY, which favour appetite inhibition, post-prandial amino acid concentrations or stimulation of dietary-induced thermogenesis^[ix]. As a high protein food, eggs may exert effects on satiety and, thus, support weight management. This has been examined by six studies as summarised in Table 1.

The results show a consistent effect of egg consumption on satiety and short-term energy intake. Two studies also found concomitant changes in gut hormones which explain the satiety effects. The single longer-term study reported a significantly greater weight loss and reduction in waist circumference when an egg breakfast was consumed in preference to a cereal breakfast.

Do eggs have a role in weight management?

While more research is undoubtedly needed, particularly on long-term weight loss, the evidence suggests a promising role for eggs in weight management. The mechanisms probably relate to protein content, but may also include the specific amino acid make up of eggs since comparisons against other high protein foods, such as chicken, appeared to show differences in favour of eggs. There are two additional benefits of including eggs in a weight loss diet. The first is portion control since eggs by their nature come in a fixed unit, helping people to recognise how much they have consumed. Secondly, the vitamin D content of eggs may help to support general health in overweight people since adipose tissue traps fat-soluble vitamins leading to a lower vitamin D status in the obese[x]. Vitamin D insufficiency is increasingly linked with a higher risk of type 2 diabetes and cardiovascular disease, possibly because of the vital role vitamin D plays in maintaining normal immune function. With few naturally rich sources of vitamin D in the diet, it is useful that two eggs can provide 36% of the EU RDA for vitamin D (5 micrograms). In conclusion, growing evidence suggests that eggs, particularly when consumed at breakfast or at lunch, are a useful addition to weight management diets.

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