

Education and debate

Healthy eating: clarifying advice about fruit and vegetables

Carol Williams, *visiting lecturer*^a

^a Human Nutrition Unit, Department of Public Health and Policy, London School of Hygiene and Tropical Medicine, London WC1H 0BT

Consumers need health information which is clear and unambiguous. Advice to "eat more **fruit** and vegetables" gives consumers no guidance on the quantities involved. Popular advice is to eat "five portions a day." This paper provides a rationale for determining which foods are included within this advice—for example, processed foods such as baked beans are but potatoes and nuts should not be. It also describes how much of the most commonly consumed **fruit** and vegetables constitutes a "portion." A bowlful of salad, for example, is needed to make up a portion but an apple or banana on its own will count.

The government's nutrition task force recently decided that it wanted to provide consumers with information on the amounts of **fruit** and vegetables, bread and cereals, and fish recommended for a healthy diet. It set up a subgroup to advise on simple and practical messages on the consumption of these foods. This paper reflects the conclusions of that subgroup on **fruit** and vegetables.

Until recently health advice about **fruit** and vegetables from government organisations has tended simply to recommend eating "more." This advice is open to different interpretations concerning which **fruit** and vegetables are included (does it include potatoes or **fruit** juice?) and the amounts.

No universally accepted convention exists on which foods should be included in health advice on **fruit** and vegetables.¹ When different definitions are used misleading conclusions can be drawn about current levels of **fruit** and vegetable consumption, and the interpretation of dietary surveys can be conflicting. Lack of clarity over the status of the more controversial foods such as dried **fruit** or pulses can lead to confusion and uncertainty among consumers. Disagreement among academics and health professionals over these issues lends further weight to the public perception that nutrition experts "never agree."

Advice which simply recommends eating "more" gives consumers no indication of how much is reasonable and allows complacency about present levels of consumption. A study of **fruit** and vegetable consumption in Scotland found that among respondents whose intake of **fruit** and vegetables was low (less than two portions a day) 55% thought that they were eating enough and already eating "more."² In England, the nutrition task force noted that "even where consumers are aware of the main healthy eating messages they are often unsure how to translate these into appropriate food choices."³ Providing practical quantified advice on healthy intakes of foods may help to solve this problem.

National quantified targets

Before the Committee on the Medical Aspects of Food Policy's cardiovascular review group published its report in November 1994⁴ there were no national numerical goals for **fruit** and vegetable consumption for England, Wales, and Northern Ireland. The Scottish diet report in 1993 recommended that Scotland's population should eat an average of at least 400 g of **fruit** and vegetables (excluding potatoes) a day.⁵ This is consistent with the lower limit population goal for **fruit** and vegetable consumption contained in the World Health Organisation's report Diet, Nutrition and the Prevention of Chronic Diseases.⁶ The cardiovascular review group recommends a 50% increase in the mean population intake of **fruit** and vegetables.

Estimates of current intakes of **fruit** and vegetables in Britain vary. The National Food Survey estimated mean consumption of **fruit** and vegetables to be around 275 g per person a day,⁷ but this excludes foods eaten outside the home and was based on households so that the average includes the amounts eaten by small children. It also uses the weight of foods bought, not eaten so includes the weight of peel, core, and discarded outer leaves etc. I have adjusted the figures from the National Food Survey to take account of this using factors for edible proportions,⁸ and my estimate is that the mean weight of **fruit** and vegetables consumed is around 240 g/day. Data from the Dietary and Nutritional Survey of British Adults (which recorded amounts actually consumed and includes food eaten outside the home) indicate a mean adult consumption of **fruit** and vegetables of around 250 g a day. On these figures, a 50% increase in consumption would raise mean intakes to around 375 g and purchases to around 435 g a day. These figures are lower, but similar to the 400 g target of the Scottish diet report and the World Health Organisation report. Practical advice for consumers

What then is the practical interpretation of this 400 g target? Popular health magazines have advised consumers to eat "at least five portions of **fruit** and vegetables a day" based on "decent sized" portions of around 80 g.^{10 11 12 13} Public awareness of the "at least five" message is growing in Britain and it is now widely used in the popular media. It has been used by the Europe Against Cancer programme¹⁴ and is the basis of several commercial promotions.^{15 16} The concept of "five a day for health" is also well established in the United States.^{17 18}

But is five correct? There are currently no accurate figures available on the number of servings of **fruit** and vegetables consumed in Britain. Comparison of mean intakes from the adult's survey¹⁹ with data on average portion

sizes as published by the Ministry of Agriculture, Fisheries, and Food (table I)²⁰ suggests that most people, particularly those in lower socioeconomic groups, are eating fewer than five portions a day. Even if there was agreement on what amounts constitute a portion, we do not know whether the "eat five" message is effective at achieving the desired dietary changes.

TABLE I--Average serving sizes²⁰
taken from weights recorded in
recent dietary surveys

Food	Average serving size (g)
Medium apple (without core)	100
Medium banana (without skin)	100
Average serving of brussels sprouts	90
Medium portion of boiled carrots	80
Medium portion of peas	70
Medium tomato	85

In the absence of research into the effectiveness of particular quantified advice on **fruit** and vegetable consumption, any recommendation should encourage greater consumption but not be so ambitious that it puts people off.

Consistency is also important in fostering confidence. Eating five portions a day clearly represents an increase in consumption for most of the population, and there is currently no evidence to suggest that it is either inappropriate or ineffective in achieving levels of desired dietary change. On the basis of these considerations the nutrition task force subgroup advises people to aim to eat at least five portions/servings of **fruit** and vegetables a day.

Which foods are included?

Different types of **fruit** and vegetables have differing nutritional attributes--for example, avocado pear is an excellent source of vitamin E but is also high in fat. Ideally, consumers need to be encouraged to eat **fruits** and vegetables with a range of nutritional characteristics. This can be achieved by emphasising variety--for example, "try to eat five different **fruits** and vegetables." This avoids the need to complicate advice further and should help to maximise levels of intake. Agreement is also needed on the place of more controversial foods. The subgroup believes that **fruit** juice, baked beans and other pulses, dried **fruit**, and **fruit** and vegetables which are frozen, canned, or used as a main ingredient in recipes or composite foods should be included but that potatoes and nuts should be excluded (table II).

TABLE II--Controversial foods and advice on **fruit** and vegetables

Conclusion	Rationale
Exclude potatoes	Biologically potatoes are a vegetable, but dietetically they are a "starchy staple"
Exclude other starchy staples such as yams, cassava, plantain when eaten as a starchy staple	(major source of complex carbohydrate). They are used in place of other starchy staples and main carbohydrate sources
Include root crops such as carrots, swedes, turnips eaten in addition to main starchy staple	such as bread, pasta, or rice. They are not used interchangeably with other vegetables. This is in keeping with Balance of Good Health food selection guide for the UK. ²¹
Include fruit juice	Fruit juice can provide most of the vitamins and minerals of fresh fruit , but the structure of the food is disrupted and most of the fibre is lost. Most of the intrinsic fruit sugars in the fruit will have become extrinsic during extraction and more carcinogenic
Fruit juice should count only once towards the "at least five a day" recommendation, so that consumers do not think they can achieve five by drinking litres of fruit juice	Most fruit drinks, squashes, and cordials do not contain sufficient fruit juice
Exclude fruit drinks, squashes, and cordials	

Include baked beans and other pulses	Pulses are rich in fibre, virtually free of fat, and a useful source of iron and protein, but they do not provide much vitamin A, C, or E. Dietary advice is that pulses are an alternative to meat, but also count towards fruit and vegetables For many who consume low amounts of fruit and vegetable, particularly children, baked beans are one of the few they currently eat. Encouraging people to eat "at least five" is less off putting when they start from a base of one or two portions currently consumed, rather than zero
Exclude nuts	Nuts are usually consumed in small quantities as a snack item and contribute little to the average UK diet.
Include dried fruit . Use portions based on equivalent wet weight. Supporting advice needs to emphasise the need for variety and getting the rest of the five portions from other fruit and vegetables	Although dried fruit is a source of dietary fibre and various vitamins and minerals, the drying process converts much of the intrinsic sugar to extrinsic and destroys most labile vitamins such as vitamin C; and the dried fruit is highly energy dense. (Including dried fruit in "at least five" advice could encourage consumption of dried fruit outside a meal.) But dried fruit clearly is a fruit .
Include frozen and canned fruit and vegetables	Frozen fruit and vegetables have similar, and sometimes better, nutritional profiles than fresh fruit and vegetables. Consumers should be encouraged to choose produce tinned without sugar or salt.
Include composite (recipe) or processed foods provided they contain enough fruit or vegetables Some processed foods are unlikely to contain sufficient fruit or vegetable ingredient and are excluded--for example, ketchup, processed vegetable soups, fruit cakes, and yoghurts	The fruit in a fruit pie, or the vegetables in a ready meal, can contribute towards the "at least five" advice irrespective of the fat or sugar content of the other ingredients. To count as a portion, the fruit or vegetable needs to be present in sufficient quantity. For example, if the amount of apple in a serving of apple pie is equivalent to a whole apple, it counts as a portion Some processed foods--for example, fruit jam and fruit drinks--retain relatively little of the nutritional quality of the ingredients. Others contain very small amounts of fruit or vegetables.

How much in a portion?

Whether advice to "eat five a day" should refer to the number of occasions of eating **fruit** and vegetables or the number of portions is uncertain. To achieve the kind of dietary changes proposed in health strategies such as the Health of the Nation and The Scottish Diet advice needs to promote consumption of five "decent sized" servings or portions. A couple of slices of tomato in a sandwich or a few mushrooms in a chicken and mushroom pie should not count.

Nutrition information which uses a mean portion size of around 80 g as a decent sized portion ties in well with average serving sizes used by households in Britain.²⁰ The main area of discrepancy is with salad foods: consumers and caterers should be told that it is necessary to eat a "bowlful" of salad to count as one portion.

Table III uses this approach to show amounts which constitute a "portion" of **fruit** and vegetables. Supporting advice should explain that serving size should reflect age, sex, and activity and that active young men would be expected to eat larger portions. Similarly, small children can still aim to "eat at least five" but their portions may be smaller.

TABLE III--Advice on portions for consumers on "eating five portions of **fruit** and vegetables a day." (The term "serving spoonful" has been used

to emphasise that the amounts of **fruit** and vegetables are as served on to the plate, rather than raw ingredients)

Food type	Practical description of portion (approx 80 g)	Examples
Fruit:		
Very large fruit	One large slice	Melon, pineapple
Large fruit	One whole	Apple, banana
Medium fruit	Two whole	Plum, kiwi
Berries	Cupful	Raspberries, grapes
Stewed and canned fruit	Three serving spoonfuls	Stewed apple, canned peaches
Dried fruit	Half serving spoonful	Apricots, raisins
Fruit juice	Full wine glass	Orange juice, fresh and from concentrate
Vegetables:		
Green vegetables	Two serving spoonfuls	Broccoli, spinach
Root vegetables	Two serving spoonfuls	Carrots, parsnip
Very small vegetables	Three serving spoonfuls	Peas, sweetcorn
Pulses and beans	Two serving spoonfuls beans	Baked beans, kidney
Salad	Bowlful	Lettuce, tomato

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A more detailed list is available on request for use in preparing photographs and illustrations of portion sizes and for interpreting dietary surveys.

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