Healthcare Professionals Newsletter

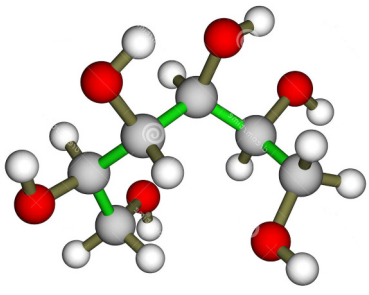
california prunes
Prunes. For life.

Sorbitol - What is known about Prunes' Special Nutrient?

Sorbitol (d-glucitol) is a type of carbohydrate known as a polyol, which is a sugar alcohol. It is found naturally in fruits and some vegetables[1], with prunes showing one of the highest levels (15.1g/100g[2]) compared to other foods e.g. per 100g dried apricots contain 6.0g, dried pears contain 8.1g and dried apples 1.9g[3].

HOW IS SORBITOL USEFUL FOR OUR GUTS?

Although its full role in the gut continues to be investigated, Sorbitol is known to be poorly and slowly absorbed in the small intestine, where it acts to increase the luminal water content of the small and large intestines due to osmosis. It is then readily fermented by intestinal bacteria to short chain organic acids and gasses, including butyric acid,[3,4] which in vivo *'maintains healthy colonic epithelium by contributing to an anti-inflammatory and anti-neoplastic environment'*. [5]



Sorbitol molecule structure

Sorbitol was recommended as a sweetening agent in diabetic diets as early as 1929. It was not until the 1960s that the laxative effect was documented[6] in a case study of a healthy 24 month old boy who suffered explosive diarrhoea following consumption of a packet of dietetic mints. 10 children (20-36 months) were also seen with similar complaints at Yale-New Haven hospital following consumption of dietetic mints. 10 further children (5-6 year olds) were given one packet of mints containing 9.3g sorbitol, and this caused softer stools with a high sorbitol content (5-20mg/g wet stool).[6]

Compared to other polyols, sorbitol has the highest molecular weight (182g/mol) and Lenhart (2017) suggested that it *'may be approaching the upper limit for diffusion across the small intestinal epithelium, resulting in poorer absorption'*. The low absorption rate (estimated to be 25%[4]) means that not all calories are absorbed, so the calorie content of sorbitol is lower than for other types of carbohydrate (i.e. starches and sugars) at 2.4kcal/g and has a very low GI of 9±4.

Its absorption in the gut could be further restricted when consumed with fructose. A 2017 review of the effects of polyols on the GI tract[1] describes how, when sorbitol and fructose are ingested individually, they are *'relatively well absorbed'* but when consumed together they are *'incompletely absorbed'*. The mechanism for this is not clear and the authors suggest that it *'may be related to the 2 sugars competing for the same intestinal transporters'*. As well as containing significant amounts of sorbitol, prunes contain 12.45g fructose per 100g.

SHOULD SORBITOL INTAKE BE RESTRICTED?

The maximum no-effect dose for laxation can differ between individuals and by gender, with females tolerating higher amounts of sorbitol (when expressed as g/kg body weight).[7]

Research indicates that sorbitol has a valuable role to play in keeping the gut healthy

Lenhart 2017 suggests that 'healthy' individuals should be able to tolerate 10g sorbitol daily with *'only mild gastrointestinal discomfort'* such as flatulence and bloating, whereas 20g/day could cause abdominal pain and diarrhoea. As part of EU labelling laws[8], for products that contain more than 10% added polyols e.g., sorbitol, it is necessary to add a cautionary note about the laxative effect of polyols. However, this is not required for foods containing naturally occurring sorbitol, such as prunes. California Prunes contain 15.1g sorbitol/100g (naturally), and daily prune intakes of 171g in men and 140g in women (equivalent to 25.8g and 21.14g sorbitol respectively) have been demonstrated to be well tolerated.[9]

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Individuals with IBS who have issues with FODMAPS (Fermentable Oligo-, Di-, Mono-saccharides And Polyols) may benefit from restricting their sorbitol intake. If IBS symptoms are reduced after a short term (4-8 weeks) FODMAPS restricted diet, it is recommended that FODMAP foods are reintroduced (following a strict protocol) to identify triggers and create a more personalised diet[10,11], to prevent unnecessarily restricting foods that are beneficial, not only to our overall health, but to our gut microbiota. Dietetic support is recommended when following a FODMAPS diet.

OTHER BENEFITS OF SORBITOL

Sorbitol is commonly used as a sugar replacer due to its ability to contribute to the maintenance of tooth mineralisation, and potential to induce a lower blood glucose rise compared to other sugar contained in foods and drinks.[12] Being heat stable, having a high hygroscopicity and protecting against loss of moisture, it is regularly used in confectionery.[1] This is one of the reasons why prunes are used very effectively as a sugar and fat replacer in baking to provide softer sponges; and, as a result of the subtle sweetness of sorbitol, prunes can be used to enhance savoury foods such as pork dishes, tagines and beef burgers.

More research is needed to fully explore the role of sorbitol (and other polyols) on the microbiome following Lenhart's conclusion that *'further research is needed to understand the effects of specific polyols on gastrointestinal function, sensation, microbiome, and metabolome in health and disorders such as IBS.'*

Prunes for All Year-Round Convenient Snacking, with Nutritional Benefits

Researchers from San Diego State University have demonstrated the nutritional benefits of including 100kcal/42g prunes as a snack twice daily (approximately 8 prunes/day) for 8 weeks in healthy overweight adults as an alternative to muffins matched for calorie, carbohydrate, fat and protein content.

Fibre intakes significantly increased by 6g daily in the prune consumers and no changes were seen in the muffin group.[13] Additionally, LDL cholesterol decreased by 30% in the prune group, compared to the those consuming the muffin snack; and potassium intake significantly increased in the prune group.

Prunes are therefore a nutritious ingredient for snacking, especially as they contain only naturally occurring sugars and **no added sugar.** As such they can be a useful, readily available, all year-round snack to help boost fibre and fruit intakes in many situations:

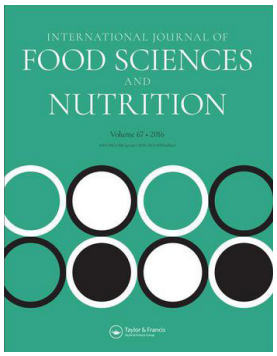
- **California Prunes are an alternative option when local and seasonal fruits are in short supply;**
- **California Prunes are portable and easily stored without damage in hand bags, sports bags and briefcases,**
- **California Prunes are particularly useful as an afternoon snack in hot weather when other fruit might not fare so well and spoil; and**
- **California Prunes are an alternative to sugar-laden dried fruits, for use in seasonal dishes such as Christmas puddings and cakes, Stollen, and Panettone.**

Dried Fruit and Public Health – What does the evidence tell us?

Scientists have reviewed the evidence on public health and the role of dried fruit in a healthy diet and, in an informative healthcare professional workshop held in June 2018, discussed many commonly held but incorrect perceptions.

Traditional dried fruits contain only naturally occurring sugars, with no added sugars or free sugars, and are nutritionally similar to fresh fruit though more concentrated, with the exception of vitamin C. During the round table discussion, it was agreed that there were multiple gaps in the research around many aspects of dried fruit and public health, including dried fruit's role in dental and gut health and its contribution to the 30g/day fibre and 5-a-day fruit and vegetable recommendations.

Proceedings from this event have now been published[14] and are freely available at: https://www.tandfonline.com/doi/full/10.1080/09637486.2019.1568398. This paper explores a range of topics relevant to public health, including the complexity of the relationship between dried fruit and dental health, and outlining the poor evidence on which current public health messages to limit consumption to mealtimes are based. Gut health and its importance in public health is also explored, outlining the research specific to dried fruit and its beneficial effects on gut health, which includes prunes' role in supporting normal bowel function.



Further topics discussed include satiety, polyphenols and the nutritional composition of dried fruit.

Listen
Research Article

Dried fruit and public health – what does the evidence tell us?

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Abstract

A scientific workshop held in the UK explored the potential contribution of traditional dried fruits to public health, identified gaps in the evidence and addressed priorities for research. Presentations considered the categorisation and composition of dried fruits; dried fruit and gastrointestinal health; the polyphenol content of dried fruits and their potential contribution to health; dried fruit and appetite in relation to the psychology of snacking and obesity; dried fruit and dental health including its role as a snack; and conflicts in public health advice for dried fruits. A round table discussion explored the contribution of dried fruit to "five a day" fruit and vegetable intake and fibre intake, whether dried fruits have equivalence with fresh in terms of dietary advice, advice on snacking in relation to dental health and appetite control, informing the public about different types of dried fruits and avoiding consumer confusion, and future research requirements.

Keywords: Dried fruit, composition, dental health, gastrointestinal health, satiety, polyphenols

New research by the Dried Fruit Association, which questioned the snacking habits of 1090 UK adults, revealed that Brits are obsessed with snacking! 81% snack daily, commonly on crisps (67%) and chocolate (59%), whilst fresh fruit is ranked only 5th (38%) behind biscuits (46%) and sweets (41%). Dried fruit was ranked 11th and eaten by 13% of respondents. Low dried fruit consumption may be in part due to common misconceptions about dried fruit, which were also highlighted by the research, such as 26% of consumers assuming that dried fruit is nutritionally different to fresh, when in fact traditional dried fruit, with the exception of vitamin C, is nutritionally similar to fresh; and 31% believed that dried fruit contains too much sugar, however dried fruit is simply fresh fruit with the water removed, e.g. one plum becomes one prune. Furthermore, 18% believed that dried fruit is bad for our teeth, yet a comprehensive review by Dr M Sadler[15,16], highlighted that there is limited research to support this negative perception.

California Prune Board's Nutritional Advisory Panel

The California Prune Board (CPB) represents 800 prune growers and 28 prune packers under the authority of the California Department of Food and Agriculture.

The Board supports research to discover new, and/or add validity to known, health and nutrition benefits of eating prunes. Nutrition research provides the scientific rationale for consumers to include prunes, as a nutritious food, as part of a healthy dietary pattern and lifestyle. Established in 1999, the CPB's Nutrition Advisory Panel (NAP) includes scientific experts in women's health, consumer education, dietary fibre, carbohydrate composition and bioactive compounds. The panel also works with researchers around the world. CPB are delighted to announce two new NAP members- Dr Blumberg and Dr Cresci.

> *"The California Dried Plum*+ Board, along with other commodity boards, have developed independent Scientific Nutrition Advisory Panels to guide and evaluate the research they fund."*

**Prunes are dried plums. +Now known as the California Prune Board*

The full panel comprises the following members:

- **Jeffrey Blumberg,** Ph.D., FASN, FACN, CNS-S, Research Professor, Gerald J. and Dorothy R. Friedman School of Nutrition Science and Policy, Tufts University
- **Kristine L. Clark,** Ph.D, RD, FACSM, Director of Sports Nutrition, Intercollegiate Athletics and Nutritional Sciences Departments, Pennsylvania State University, University Par..
- **Gail Cresci**, Ph.D., RD, Full Staff, Department of Pediatric Gastroenterology, Pediatric Institute, Department of Inflammation & Immunity, Lerner Research Institute, Director of Nutrition Research within Center for Human Nutrition, Digestive Disease and Surgery Institute, Cleveland Clinic, and Assistant Professor of Medicine, Cleveland Clinic Lerner College of Medicine of Case Western Reserve University
- **Daniel D. Gallaher,** Professor, Department of Food Science and Nutrition, College of Food, Agricultural, and Natural Resource Sciences, University of Minnesota, St. Paul
- **Connie Rogers,** Ph.D., MPH, Assistant Professor, Department of Nutritional Sciences, Pennsylvania State University, University. Park
- **Connie M. Weaver,** Ph.D., Distinguished Professor Emerita, Purdue University

California Prune & Bean Veggie Burger

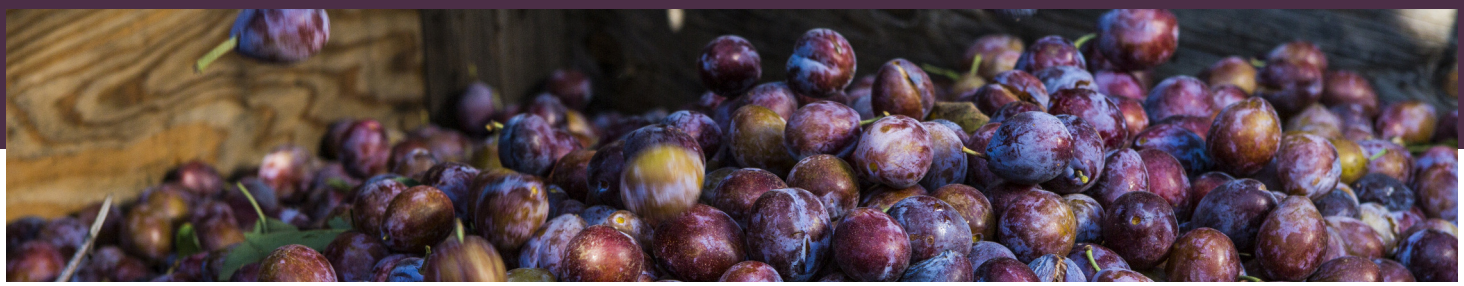
4 portions	12 mins prep time	10 mins cook time

INGREDIENTS

12 California Prunes
1 egg
3 tbsp pumpkin seeds, roughly chopped
1/2 onion, finely chopped
2 garlic cloves, finely chopped
400g tin kidney beans, drained and washed
4 tbsp rolled oats
1 medium carrot, peeled and grated
1 tbsp flax seed
1 tbsp chopped fresh coriander or parsley
2 tsp cumin
1/2 - 1 tsp chilli powder
1 tbsp cocoa powder
Dash Worchester Sauce (optional)
1/2 tsp salt (omit if beans in brine)
black pepper
1 tbsp groundnut oil, for frying
4 tbsp sesame seeds for coating the burgers (optional)

INSTRUCTIONS

1. Blend the California Prunes with the egg to make a purée.
2. Heat a little oil and fry the onions and garlic to soften, then add the pumpkin seeds and toast for 1 minute, stirring the mix.
3. Mash the beans with a fork in a large bowl.
4. Add all ingredients (except the oil and sesame seeds) and combine thoroughly using a metal spoon.
5. Cover and refrigerate for at least 30 minutes until the mixture becomes firm.
6. Divide burger mix into 8 and shape into patties.
7. Place sesame seeds in a small dish and place each burger into the dish coating each side; set aside on a plate ready for cooking or keep refrigerated for up to 3 days.
8. Heat the oil and fry burgers on a medium heat for 4-5 minutes on each side, checking regularly to avoid catching. Burgers should be crispy on the outside and cooked through.



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