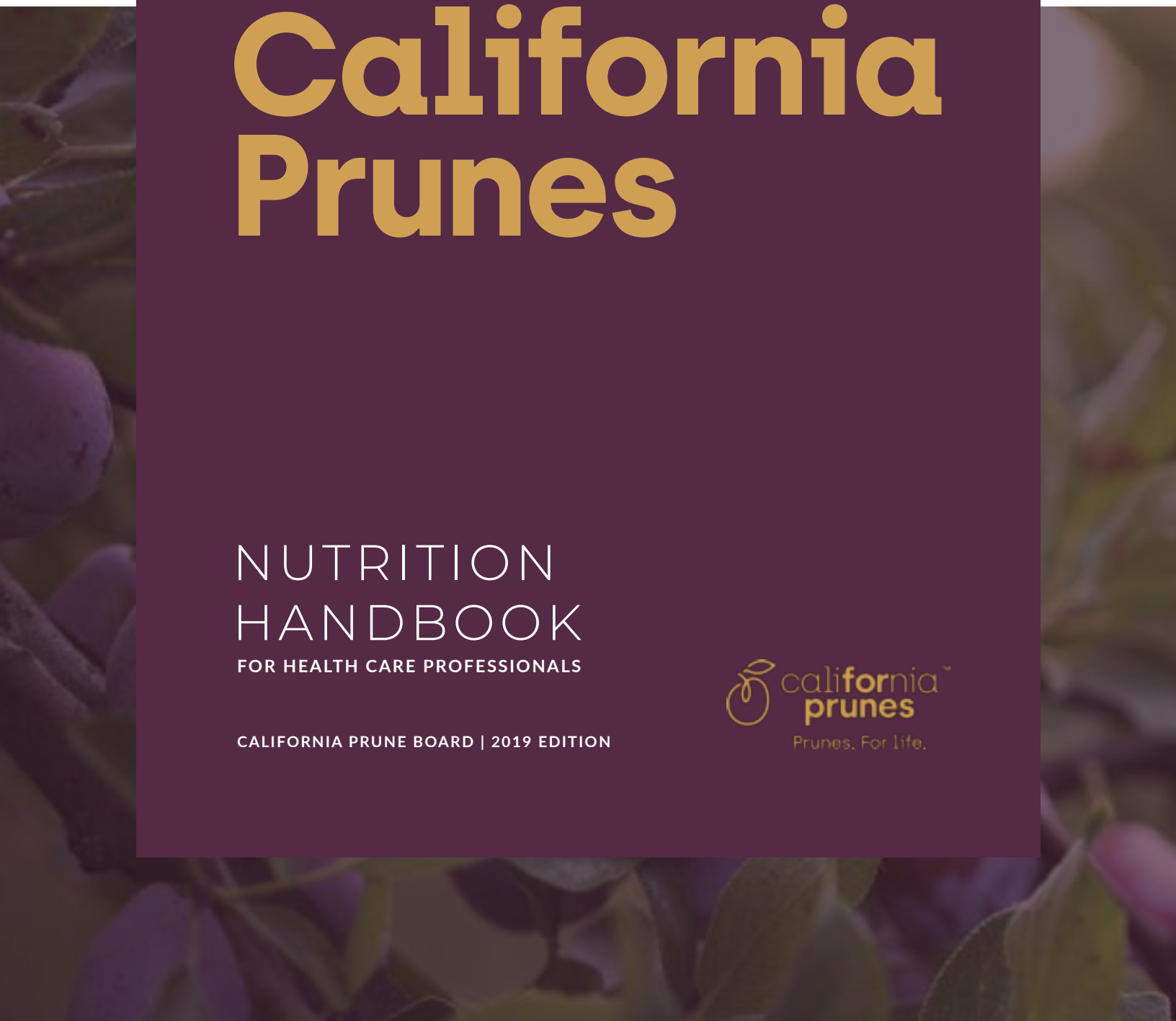

California Prunes

NUTRITION HANDBOOK

FOR HEALTH CARE PROFESSIONALS

CALIFORNIA PRUNE BOARD | 2019 EDITION

california™ prunes
Prunes. For life.

ABOUT THIS HANDBOOK

This handbook is a compilation of all-things-California Prunes as it relates to nutrition research and more. From the history of the California Prune, to the latest research on prunes and bone and digestive health, to cooking and baking ideas, this handbook is designed to be your go-to source for California Prune information.

TABLE OF CONTENTS

Introduction

WONDERS WORTHY OF PASSION

California Prunes are so well-known for good digestive health that it's hard to believe they could be good for anything else. But, in fact, California Prunes embody all kinds of wonders worth getting excited about.

For starters, there's no better place on earth to grow prunes than the lush valleys of California, where the trees reach into soils nourished by ancient rivers and up to an endless sun. Generations of farmers have brought a rigour to cultivating those trees that surpasses the most stringent agricultural oversight of any nation.

In the process they have created one of the most expertly tended growing regions in the world. The result is an extraordinary and consistent fruit that is then dried in a process perfected by California growers. As the prunes rest in climate-controlled tunnels for precise periods of time and at exacting dehydration levels, a flavour unlike any other prune in the world emerges.

It's that one-of-a-kind flavour that makes California Prunes so enjoyable as a delicious snack, brings such a fresh taste to savoury dishes, and adds a sweet, creamy nuance to baked goods.

California Prunes are famous for their fibre, with 100g eaten daily contributing to normal bowel function. However, we also know that prunes are high in vitamin K, and a source of manganese, which contribute to normal bones, and research continues to explore the mechanisms by which prunes may benefit bone health. Prunes are also naturally high in potassium, which helps with the maintenance of normal blood pressure, and are saturated fat-free; reducing consumption of saturated fats contributes to the maintenance of normal cholesterol levels. They are a source of copper, which helps to protect cells from oxidative stress, have zero fat, and contain only naturally occurring sugars.

Whether you're a health professional, or just a fan, it makes you wonder:

How can we help more people to benefit from California Prunes?

ABOUT CALIFORNIA PRUNES

California Prune growers have invested more than 150 years in perfecting the growing and harvesting techniques needed to deliver the ultimate premium prune; one that is recognized throughout the world for its legendary flavour and quality. The combination of ideal growing conditions, generations of expertise, and high quality standards has contributed to making California the world leader in prune production. The California Prune, a convenient and healthy* snack for today's busy lifestyle, represents 99% of the U.S.'s total prune production, and 40% of the world's supply of prunes.

ABOUT THE CALIFORNIA PRUNE BOARD

Since 1952, the State of California has had a Marketing Order for California Dried Plums (California Prunes) that conducts global promotion and directs nutrition and crop research on behalf of California's approximately 800 prune growers and 28 prune handlers under the authority of the Secretary of Food and Agriculture.

CALIFORNIA PRUNES AND NUTRITION RESEARCH

The California Prune Board established a nutrition advisory panel in 1997 and continues to lead the way in supporting scientifically rigorous research on the nutritional and health benefits of incorporating California Prunes into the diet. Key areas of research include: digestive health, bone health, managing hunger/satiety and microbial changes in the gut. Research indicates that prunes may be a valuable components of a healthy eating pattern, and should therefore be at the forefront of consumers' minds.

*Eating 100g of prunes daily contributes to normal bowel function.

California Prunes:

ALL YOU NEED TO KNOW

HISTORY OF CALIFORNIA PRUNES

Prunes are a fruit with an ancient heritage, originating from Western Asia, specifically an area near the Caucasus Mountains bordering the Caspian Sea. From there, prunes were carried west and eventually found their way into Southern, Central, and Western Europe as well as the Balkans, where they have thrived ever since.

ALTHOUGH ALL PRUNES ARE PLUMS, NOT ALL PLUMS CAN BE PRUNES.

Only certain varieties of plum have the essential qualities for effective dehydration, the process by which they become prunes. California Prunes are the “Improved French” variety of plums. This variety is an offshoot of La Petite D’Agen, a plum native to Southwest France. Plum trees were introduced to North American soil in 1856 by Louis Pellier, a French nurseryman who arrived in California in 1848 in search of gold. After his unsuccessful mining venture, he purchased land in the fertile Santa Clara Valley in 1850 and went back into the nursery business. The original D’Agen plum graft stock was in the selection he took to California in 1856. By 1900, prune orchards in California covered approximately 90,000 acres.

Today, there are about 46,000 production prune orchard acres concentrated in the Sacramento and San Joaquin valleys. Revered as part of California’s rich history, the prune remains a vital player in California’s economic wealth.

LIFE CYCLE OF A CALIFORNIA PRUNE

IN THE ORCHARD

When growers plant a plum tree, they have a four- to six-year wait before they see the fruits of their labour. Even then, a tree needs 8 to 12 years in the ground before it reaches full production capacity of 150 to 200 pounds (70-90kgs) of raw fruit per year. At that point, a grower can look forward to about 20-30 years of that tree's commercial productivity, during which time it produces the premium-quality plums that result in the California Prunes that consumers know and love.

FROM WINTER REST TO SUMMER SUN

The prune tree is deciduous, which means that it is dormant during the winter months. However, just before it enters this phase, the growers have a chance to carry out some essential maintenance, which ensures a healthy growth pattern and enables the tree to produce, in the spring, a wealth of blossom for pollination and to bear the optimum number and size of premium plums.

When spring arrives, 46,000 acres of California prune orchards are covered in a fragrant blanket of white blossoms. But after just a week, the blossoms drift to the ground and the orchards' palette shifts to a deep chartreuse as new fruit forms and leaf buds burst.

During the summer, California gets very little rain, so growers irrigate the orchards using modern methods and technology to ensure efficient use of water. By using precision irrigation instead of relying on rain, the growers have more control over the quality of the fruit; giving the trees exactly the amount of water they need to supplement what's available underground.

THE TIME IS RIPE

By mid-August, the orchards are ready for harvest, which usually takes about 30 days. Prunes are tree-ripened, so growers determine harvest time by checking fruit firmness and sugar content with a tool called a light refractometer.

Growers once smoothed and softened the soil beneath the trees, letting the plums drop naturally before gathering them to take to the dehydrator. This method required three to four "pickings" to strip an orchard completely of fruit.

In order to become more efficient and deliver consistent top-quality fruit, harvesting today is done by machines. A mechanical shaker grabs a tree's trunk and, in a matter of seconds, shakes the entire crop into a receiver that catches the fruit and then conveys it into a large storage container. From there, it's a quick ride for the plums to the dehydrator.

DRIED, PACKED AND READY TO GO

Processors waste no time transferring their freshly harvested fruit to the dryers, where 3lbs (approx. 1.5kg) of fresh plums will become 1lb (500g) of prunes. Firstly, the fruit is washed before being placed on large wooden trays. The plums are then dehydrated in a sequence of carefully controlled and strict sanitary operations that maximise premium taste and texture whilst ensuring product consistency and food safety. Super-sensitive thermostats tightly control temperatures to yield the uniform, high-quality fruit for which California Prunes are famous. Because prunes store best at 21% moisture, post-harvest dehydration targets this level.

From the dehydrator, the prunes go to state-of-the-art packing plants, where trained personnel inspect them, grade them for size and store them ahead of final processing and packaging. There they remain, in storage facilities, until needed for further processing.

Unlike the majority of dried fruits, prunes are packed to order, which means that they are rehydrated, steam pasteurized and put through a final inspection before being packaged for shipping. This is the standard procedure whether the order calls for 25- or 30-pound (9-14kgs) bulk cases or the 1- to 2-pound (0.5-1kg) packages of California Prunes frequently seen on grocery store shelves.

PRODUCTS, AVAILABILITY AND STORAGE

California Prunes are a very versatile fruit, available in retail stores in various forms including whole prunes, pitted prunes, diced prunes and prune juice.

Prunes are typically packed in bags, cartons and canisters and can usually be found with other dried fruits in the produce section, the canned fruit section or the baking section. Prunes are ready-to-eat right from the package as a healthy* snack, or can be used as a versatile cooking or baking ingredient. They are often puréed and used to enhance flavour, or as a substitute for some of the added fat in baked products. Prunes do not require refrigeration but, once a package has been opened, it should be resealed and stored under cool, dry conditions. Sealing the unused prunes in an airtight container and storing them in the refrigerator will also help keep them moist and juicy.

Prune juice is typically available in bottles and cans and is found in the juice section of the grocery store.

*Eating 100g of prunes daily contributes to normal bowel function.

California Prunes:

NUTRITION FACTS

Nutritional Information

	Per 100g	Per 28g*
Energy	**968kj / 229kcal**	**271kj / 64kcal**
Fat	0g	0g
of which saturates	0g	0g
Carbohydrates	57g	16g
of which sugar	38g	10.6g
of which polyols	15.1g	4.2g
Fibre	7.1g	2g
Protein	2.2g	0.62g
Salt	0g	0g

Vitamins & Minerals	Per 100g (%RI)	Per pack/28g (%RI)
Vitamin K	60µg (80% RI)	16.7µg (12% RI)
Vitamin B6	0.21mg (15% RI)	0.06mg (4% RI)
Potassium	732mg (37% RI)	205mg (10% RI)
Copper	0.28mg (28% RI)	0.08mg (8% RI)
Manganese	0.3mg (15% RI)	0.08mg (4% RI)

*Approximately 3-6 prunes per 28g depending on size of prune

100g of California Prunes (10-12 prunes) provides 229 calories, and contains:

- **7g fibre per 100g**
  7g per 100g fibre, making California Prunes high in fibre. Fibre has been identified by the European Food Safety Agency (EFSA) as a nutrient of public health concern as under-consumption of fibre has been linked to unfavourable health conditions. EFSA recommends that 25g fibre is consumed daily.
- **732mg/100g potassium (37% reference intake)**
  California Prunes are high in potassium, which contributes to normal muscle function.
- **Only naturally occurring sugars**
  California Prunes have no added sugar.
- **No fat or salt**
- **59.5mcg/100g vitamin K (79% reference intake)**
  California Prunes are an excellent source of vitamin K, which contributes to the maintenance of normal bones and normal blood clotting.
- **Vitamin B6**
  California Prunes are a source of vitamin B6, which contributes to normal red blood cell formation and the regulation of hormonal activity.
- **Manganese and copper**
  California Prunes are a source of copper, which contributes to maintenance of normal connective tissues, and a source of manganese, which contributes to the normal formation of connective tissue.

This Nutrition Information is based on the EU Sample Pack Nutrition Information Label. Values have been rounded. Nutrition Information labels may differ for branded products.

DIETARY FIBRE

With 7g per 100g, California Prunes are a good source of dietary fibre, providing both soluble and insoluble dietary fibre.

Dietary fibre is considered by the European Food Safety Agency (EFSA) a nutrient of public health concern because most of us fail to meet daily fibre intake recommendations: globally, fewer than 3% of men and 6% of women achieve the daily recommendation of at least 14g fibre/1000kcal (Dreher 2018).

The beneficial effects of fibre on the digestive tract, including laxation, are recognised, as is the role of fibre in general good health. These benefits may be related to the combined protective nutrients found along with fibre in fruits, vegetables, whole grains, nuts, seeds and legumes.

CARBOHYDRATES AND SUGARS

As one of the five-a-day portions, California Prunes are a low calorie snack, providing fewer than 70 calories per 28g (3-6 prunes). Each 28g serving contains: 15.9g of total carbohydrate that provide energy, 10.6g of naturally occurring sugars (slightly more than 7g glucose and 3.5g fructose) and 0.04g sucrose per serving. Prunes have no added sugars. In addition they contain about 4g of sorbitol (a sugar alcohol) per serving. 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, which in vivo 'maintains healthy colonic epithelium by contributing to an anti-inflammatory and anti-neoplastic environment' (Yao et al 2014, Livesey 2003, Stacewicz-Sapuntzakis 2013))'

Prunes contain carbohydrates. A daily intake of 130g of carbohydrate contributes to the maintenance of normal brain function.

Prunes contain carbohydrate. Carbohydrate contributes to the recovery of normal muscle function (contraction) after highly intensive and/or long-lasting physical exercise leading to muscle fatigue and the depletion of glycogen stores in skeletal muscle. The beneficial effect is obtained with the consumption of carbohydrates, from all sources, at a total intake of 4g per kg body weight, at doses, within the first 4 hours and no later than 6 hours, following highly intensive and/or long-lasting physical exercise leading to muscle fatigue and the depletion of glycogen stores in skeletal muscle.

GLYCAEMIC INDEX (GI) AND GLYCAEMIC LOAD (GL)

Prunes have a low glycaemic index (GI) of 29. The presence of fibre and sorbitol in prunes may contribute to this low GI. (Foster-Powell K, Holt S, Brand-Miller J. International table of glycaemic index and glycaemic load values. Am J Clin Nutr.2002: 76; 5–56).

The glycaemic index (GI) measures the impact of carbohydrate foods on raising blood sugar levels. The glycaemic index (GI) measures, over a two-hour period, an individual's response to eating a carbohydrate-containing food (usually 50 grams of available carbohydrates) compared to the individual's response to the same amount of carbohydrates from either white bread or glucose. Carbohydrate foods are then classified as high (above 70), intermediate (56–69), or low (0–55) GI (Foster-Powell 2002).

The glycaemic load (GL) of a food is determined by multiplying the glycaemic index by the amount of carbohydrates per serving and then dividing by 100. The GL of California Prunes per 60g is 10 based (Foster-Powell 2002). Research continues into the potential benefits of consuming diets with a low glycaemic load (GL).

POLYPHENOLS, BIOACTIVES, AND HEALTH

Beyond their basic nutrient composition, plants produce a variety of compounds that have biological activities with the potential to improve health. Polyphenols are among the major classes of these plant phytochemicals. Neochlorogenic and chlorogenic acids are the dominant phenolic compounds in prunes (Donovan et al 1998).

Polyphenols contribute to a food's colour, taste, bitterness and other sensory flavours, and are thought to be amongst the compounds that have anti-oxidant or anti-inflammatory properties. The term 'antioxidant' refers to the ability to decrease or slow damage to cells caused when free radicals; unpaired, unstable electrons that can begin certain disease processes when they bombard healthy cells seeking a pair. Antioxidants 'give up' electrons to free radicals thus making them more stable.

The body produces free radicals when metabolizing food but external sources (sun, environment, cigarette smoke) can also result in exposure to free radicals. The body has its own internal antioxidant system, but there are many different antioxidant compounds in foods including vitamins C, E, carotenoids, and minerals such as selenium, manganese and copper. Prunes are a source of copper and manganese, which contribute to the protection of cells from oxidative stress.

California Prunes:

NUTRITION RESEARCH

CALIFORNIA PRUNES, DIGESTIVE AND GUT HEALTH

Maintaining digestive health is an important component of overall well-being. Eaten in quantities of 100g per day, prunes contribute to normal bowel function in several ways through the provision of dietary fibre, sorbitol and polyphenols. Their potential to contribute to the gut microbiome is the subject of current research.

Prunes are the only natural, whole fruit to achieve an authorised European health claim: Prunes contribute to normal bowel function when 100g (about 10) are eaten daily (European Food Safety Authority). Research also suggests that eating 80g (about 8) prunes may offer the same desired effect (Lever E et al 2018).

Bifidobacteria are considered beneficial and are thought to confer positive health effects. Hence Bifidobacteria often are the targets for prebiotics, complex carbohydrates that resist digestion in the small intestine and reach the colon where they are fermented by the gut microflora. More research is needed to explore California Prunes' influence on the gut microbiota and potential to function as a prebiotic.

Details of research into the effects of prunes on digestive and gut health can be found in the California Prunes' Research Brochure which is located in the Health Care Professionals' section of the California Prune Board's UK website: www.californiaprunes.net

California Prunes for Bones

It's never too early—or too late—to start thinking about nutrition and exercise for healthy bones.

100G (10-12) CALIFORNIA PRUNES, PROVIDES 229 CALORIES, AND CONTAINS:

- 7g fibre, making California Prunes high in fibre. Fibre has been identified by the European Food Safety Agency (EFSA) as a nutrient of public health concern as under-consumption of fibre has been linked to unfavourable health conditions. EFSA recommends that 25g fibre is consumed daily
- 732mg potassium (37% reference intake). California Prunes are high in potassium, which contributes to normal muscle function
- 59.5mcg vitamin K (79% reference intake). California Prunes are an excellent source of vitamin K, which contributes to the maintenance of normal bones and normal blood clotting
- No salt
- Only naturally occurring sugars, with no added sugar
- No fat
- Manganese. Prunes are a source of manganese, which contributes to the normal formation of connective tissue
- Copper. Prunes are a source of copper, which contributes to the maintenance of normal connective tissues
- Vitamin B6. Prunes are a source of vitamin B6, which contributes to the normal red blood cell formation and regulation of hormonal activity

Research suggests that eating five to six prunes (50g) per day **may help reduce bone loss** in post-menopausal women. Prunes are high in vitamin K and a source of manganese, which contribute to the maintenance of normal bones.

Kids/Teens

90% of peak bone mass is acquired by **age 18 in girls** and **20 in boys.**[3]

Bone injuries are among the most common sport-related injuries for children.[4]

Do **60 minutes** of moderate to vigorous activity every day to maintain healthy bodies and build strong bones.[5]

20s/30s

Bone development reaches a maximum around **age 30.**[6]

Do **30 minutes** of weight bearing **4x /week** activities to maintain muscle mass and preserve bone strength.[7]

40s/50s

1 in 2 women and up to **1 in 4 men** over 50 will break a bone due to osteoporosis.[8]

Women can lose **up to 20%** of their bone density 5-7 years after menopause.[9]

Keep moving **4-5 days** a week to maintain strength.

60s & Beyond

1 in 5 women develops osteoporosis by age 70.[10]

WWW.CALIFORNIAPRUNES.NET

1. www.fasebj.org/content/29/1_Supplement/738.12 abstract
2. www.ncbi.nlm.nih.gov/pubmed/27239754
3. www.niams.nih.gov/health_info/bone/osteoporosis/bone_mass.asp
4. National Institute of Arthritis and Musculoskeletal and Skin Diseases. Childhood sports injuries and their prevention: a guide for parents with ideas for Kids. NIH Pub. 2006. 06-4821
5. www.cdc.gov/physicalactivity/basics/children/
6. orthoinfo.aaos.org/topic.cfm?topic=a00127
7. orthoinfo.org/topic.cfm?topic=A00674
8. www.nof.org/prevention/general-facts/what-women-need-to-know/
9. www.nof.org/prevention/general-facts/
10. www.iofbonehealth.org/facts-statistics

CALIFORNIA PRUNES AND BONE HEALTH

Strong, healthy bones are the foundation for lifelong vitality and independence. The bone mass reached in the late teens and early twenties (www.nof.org/preventing-fractures/nutrition-for-bone-health/peak-bone-mass) is an important determinant of bone health throughout aging. Prunes contain nutrients influential for bone health. They are high in vitamin K and a source of manganese, which contribute to the maintenance of normal bones; and are high in potassium, which contributes to normal muscle function. Furthermore, their role in promoting bone health is supported by active preclinical and clinical research in models of hormone deficiency, aging and exposure to certain types of radiation.

Reviews summarizing the current knowledge on prunes and bone health noted that, although the exact mechanism for the protective effects of prunes remains to be determined, it is thought that the additive and/or synergistic effects of prunes' bioactive phenolics and nutrients are partly responsible (Wallace TC. et al 2017; Arjmandi B, Johnson S, Pourafshar S, Navaei N, George K, Hooshmand S, Chai S, Akhavan N. et al 2017). Preclinical animal and cell studies suggest that prunes and/or their extracts may enhance bone formation and inhibit bone resorption through their actions on cell signalling pathways that influence osteoblast and osteoclast differentiation and are consistent with clinical studies that show that prunes may exert beneficial effects on bone mineral density (BMD).

Details of research into the effect of prunes on bone health can be found in the California Prunes' Research Brochure which is located in the Health Care Professionals' section of the California Prune Board's UK website: www.californiaprunes.net

Q&A WITH BONE HEALTH EXPERT, DR. SHIRIN HOOSHMAND

Shirin Hooshmand, Ph.D., researcher and associate professor at San Diego State University, specialises in nutrition research related to bone and cartilage health. A research consultant to the California Prune industry, many of her studies examine the effect of prunes on bone health.

Q: How did you become interested in bone health?

A: Nutrition plays an essential role in bone health. Bone loss may be prevented, repaired and reversed using nutrition. My research focuses mainly on prevention and reversal of bone loss.

Q: What are common bone health conditions?

A: Osteoporosis is a bone disease that occurs when the body loses too much bone, makes too little bone, or both. Osteoporosis is more typical among the elderly and more common in women due to lower estrogen levels after menopause. Osteopenia refers to bone density that is lower than normal peak density, but not low enough to be considered osteoporosis. Approximately 44 million people in the United States suffer from either osteoporosis or osteopenia due to hormonal problems, medications, genes and other issues.

Q: Can you attest to the nutritional attributes of California Prunes?

A: California Prunes have a variety of nutrients that make them unique. Among other traditional dried fruits, only prunes are high in vitamin K. They are also a source of manganese, copper and potassium. The nutrients and vitamins in California Prunes combine to benefit bone health.

Q: Have California Prunes shown favourable results specific to osteoporosis?

A: As we age, we begin to lose bone density, but we may be able to delay and repair bone density loss through nutrition. Several clinical studies have shown that 50 – 100 grams of prunes per day can can help to reduce bone loss in women with low bone density (osteopenia).[1,2,3]

Q: What is the most exciting finding that your research has revealed about California Prunes?

A: To date, the most exciting findings are from human studies conducted among post-menopausal women. Post-menopausal women lose 1 – 1.5 percent of their bone density per year, but studies show that women who eat prunes daily are actually able to *maintain* their bone density and *may lessen* additional loss.[1,2,3]

Q: What is the one thing you wish more people knew about California Prunes – but, don't?

A: I don't think many people are aware of all of the health benefits of California Prunes. I wish people understood that California Prunes are an amazing fruit and may positively impact bone health beginning at an early age. If people would try California Prunes, I know they — and their bones — would love them!

1 https://www.ncbi.nlm.nih.gov/pubmed/26902092
2 https://www.ncbi.nlm.nih.gov/pubmed/21736808
3 https://www.ncbi.nlm.nih.gov/pubmed/28505102

CALIFORNIA PRUNES SATIETY AND WEIGHT MANAGEMENT

Prunes are a good source of fibre and have a low Glycaemic Index.

Fruit is generally regarded as satiating due to its lower energy content compared to other foods; and its fibre content. The form of the fruit may impact satiety: fruit juice, for example, has a lower fibre content than its fresh fruit equivalent, and research has suggested that juice has a lower satiating effect than whole fruit (Farajian 2010). Dried fruit is more energy dense due to the removal of water, but has a similar energy and fibre content per individual fruit, so its effect on satiety may also differ.

Prunes have a low GI of 29 (Foster-Powell 2002) and high fibre content of 7.1g/100g. As a result, their potential role in satiety has been explored in several human studies, as detailed in the California Prunes' Research Brochure located in the Health Care Professionals' area of the California Prune Board's UK website: www.californiaprunes.net

Although not the primary outcome in a study in postmenopausal women investigating prunes' role in digestive health, women who ate 80g or 120g of prunes daily for 4 weeks reported no gain in weight (Lever E et al 2018).

The results of these studies indicate that prunes may have the potential to contribute to long term weight management. Full details of these research studies can be found in the California Prunes' Research Brochure located in the Health Care Professionals' area of the California Prune Board's UK website: www.californiaprunes.net

CALIFORNIA PRUNES AND HEART HEALTH

Prunes' nutrient profile can help support heart health:

- Prunes are high in fibre.
- Prunes are high in potassium, which contributes to the maintenance of normal blood pressure.
- Prunes are salt free. Reducing consumption of sodium (salt) contributes to the maintenance of normal blood pressure.
- Prunes are saturated fat free. Reducing consumption of saturated fat contributes to the maintenance of normal blood cholesterol levels.

CALIFORNIA PRUNES AND DENTAL HEALTH

Tooth decay depends on diet, nutrition, microbial infection and host response. Dental plaque bacteria serve as the important etiologic agent in the formation of dental caries. Food particles and sugar (sucrose) trapped on the surfaces of teeth may serve as ready sources of fermentable carbohydrates by plaque bacteria, which promote acid production that leads to demineralisation of enamel and eventually tooth decay.

Foods perceived as sticky – such as dried fruit – have often been considered more cariogenic than those that do not stick to the teeth, but this research has now been called into question. A review that explored the research around the role of dried fruit, the retention of dried fruit including prunes and potential for adverse effects on dental health found a lack of consistent data and suggested more research to ensure evidence-based practice recommendations (Sadler MJ. et al 2016).

For details of research studies into dried fruit and dental health, please refer to the California Prunes' Research Brochure located in the Health Care Professionals' area of the California Prune Board's UK website: www.californiaprunes.net and to the proceedings from a research workshop held in June 2018: : 'Dried fruit and public health - what does the evidence tell us?' published in Volume 70, Issue 6 of the International Journal of Food Sciences and Nutrition and online at https://www.tandfonline.com/doi/full/10.1080/09637486.2019.1568398

OTHER BENEFITS

For a review of prune composition and potential health benefits, see Stacewicz-Sapuntzakis M. et al 2013.

For details of research studies into the health benefits of prunes, please refer to the California Prunes' Research Brochure located in the Health Care Professionals' area of the California Prune Board's UK website: www.californiaprunes.net

California Prunes:

CULINARY VERSATILITY

COOKING WITH CALIFORNIA PRUNES

California Prunes = Flavour + Versatility

Whether whole, diced or puréed, there are endless culinary opportunities for California Prunes. The versatility of California Prunes arises from a unique and complex flavour combined with a natural sweetness that allows them to be incorporated into sweet and savoury dishes, fermented and baked products, where they add a rich, deep taste without overpowering other elements in a dish.

Culinary applications demanding more structure are satisfied from California Prunes purchased in bulk as they are typically chewier in texture, whilst packaged California Prunes tend to be softer and more moist. These different qualities are invaluable in enhancing, and bringing to the fore, the inherent flavours of the ingredients with which they are paired.

EASY CALIFORNIA PRUNE PURÉE

INGREDIENTS:

- 1 1/3 cups pitted California Prunes
- 6 tablespoons hot water

METHOD:

1. Blend the prunes and water together in a food processor until puréed
2. Use to add moisture and richness to both savoury and sweet dishes.
3. Cover and refrigerate up to 1 month.

California Prunes add depth to, and pair very well in, recipes that utilise rich and complex flavour notes.

DARK | EARTHY | TOASTY | COOKED			
CALIFORNIA PRUNES AND ...	**TASTING NOTES**	**CALIFORNIA PRUNES AND ...**	**TASTING NOTES**
WALNUTS	Earthy Tannins Bitter Fatty	MISO	Fermented Salty Sweet
DARK CHOCOLATE	Bitter Tannins Sweet Earthy Deep	CRAFT BEER	Fermented Sweet Bitter Umami
PROSCIUTTO	Salty Fatty Creamy Umami	OLIVE OIL	Bitter mouthfeel Fatty Peppery
GINGER	Earthy Spicy Winter Zingy	SQUASH	Earthy Neutral Sweet Vegetal Autumnal

The fruit's earthy, umami qualities pair with salty, acidic and fermented ingredients to perfectly juxtapose and bring out the very essence of those flavours.

BRIGHT | CONTRASTING | FRESH			
CALIFORNIA PRUNES AND ...	**TASTING NOTES**	**CALIFORNIA PRUNES AND ...**	**TASTING NOTES**
OLIVES	Salty Briny Umami Green	MINT	Fresh Herbal Spicy Green
FETA	Tart Salty Creamy Briny Umami	GRAPEFRUIT	Sour Bitter Citrus Bright Fresh
POMEGRANATE	Astringent Sharp Fresh Zingy	PASSIONFRUIT	Sharp Sweet Fruity Fresh
BITTER GREENS (ENDIVE)	Bitter Fresh Green	PRESERVED LEMON	Citrus Salty Bright Bitter

Seasonal Recipes:

CALIFORNIA PRUNE BREAKFAST OAT PUDDING

RECIPE CREATED BY LESLIE BONCI, MPH, RDN, CSSD, LDN

Yield: 2 servings | Serving Size: 1/4 cup

INGREDIENTS:

- 1/2 cup oats, dry
- 1 cup water
- 1/4 cup finely chopped California Prunes
- 1 tablespoon almond butter
- 1/4 teaspoon ground ginger
- 1/8 teaspoon grated orange peel
- 1/2 cup non-fat vanilla Greek yoghurt
- 1 teaspoon maple syrup
- 1 tablespoon sliced almonds

METHOD:

1. Mix oats, water, ginger and 3 tablespoons of the prunes together.
2. Microwave on HIGH for 2 minutes.
3. Remove from microwave.
4. Stir in the almond butter, Greek yoghurt, maple syrup and orange peel and blend well.
5. Top with the remaining 1 tablespoon of prunes and 1 tablespoon of sliced almonds.
6. Enjoy!

Seasonal Recipes:

GUACAMOLE WITH POACHED CALIFORNIA PRUNES

RECIPE CREATED BY JACKIE NEWGENT, RDN, CDN

Yield: 8 servings | Serving Size: 1/4 cup

INGREDIENTS:

- 8 California Prunes, diced
- 1 cup 100% California Prune or apple juice
- 2 1/2 tablespoons fresh lime juice
- 2 Hass avocados, peeled, pitted, and cubed
- 1/4 cup finely diced red onion
- 1 small jalapeño pepper, with some seeds, minced
- 3 tablespoons chopped fresh cilantro
- 1 clove garlic, minced (optional)
- 1/2 teaspoon sea salt
- 1/4 teaspoon ground coriander
- 1/4 teaspoon ground cumin

METHOD:

1. Add the diced prunes, prune juice, and 1 tablespoon of the lime juice to a small saucepan. Bring to a simmer over medium heat. Allow to simmer until the prunes are softened and juicy, about 5 minutes. Drain the prunes through a mesh strainer and leave in the strainer for at least 15 minutes to fully drain and cool. Reserve the juice for other culinary purpose.
2. To a medium bowl, add the avocados, onion, jalapeño, cilantro, garlic (if using), salt, coriander, cumin, and the remaining 1 1/2 tablespoons lime juice. Gently stir (do not smash avocado) until just combined. Add the prunes and gently stir until evenly combined. Adjust seasoning, and serve.

Seasonal Recipes:

FARRO WITH CALIFORNIA PRUNES, ROASTED BUTTERNUT SQUASH AND PECANS

RECIPE CREATED BY BY JACKIE NEWGENT, RDN, CDN

Yield: 6 servings | Serving Size: 1 cup

INGREDIENTS:

- 10 California Prunes, thinly sliced (3 ounces)
- 3 tablespoons apple cider vinegar
- 1/4 cup extra-virgin olive oil (divided)
- 1 1/2 teaspoons sea salt (divided)
- 1 1/2 cups uncooked farro or whole grain of choice
- 4 cups butternut squash cubes (about ½-inch)
- 3 scallions, thinly sliced, green and white parts separated
- 1/2 cup packed thinly sliced fresh basil
- 1/4 cup packed chopped fresh flat-leaf parsley
- 1/3 cup pecan pieces or pine nuts, preferably pan-toasted

METHOD:

1. In a medium bowl, whisk together the apple cider vinegar, 2 tablespoons of the olive oil, and 1 teaspoon of the salt. Set aside.
2. Add the farro to 5 cups of cold water in a large saucepan and bring to a boil over high heat. Reduce heat to low, cover, and cook according to package directions until tender. (Note: Cooking time will vary.) Drain well of excess liquid through a fine mesh strainer. Add the cooked farro and sliced prunes to the apple cider mixture; stir to combine and set aside.
3. Meanwhile, heat the remaining 2 tablespoons of olive oil in a large cast iron or other non-stick skillet over medium heat. Add the butternut squash cubes and remaining 1/2 teaspoon of salt and cook while stirring occasionally until just tender and lightly browned, about 15 minutes. Add the white part of the scallions and cook while stirring occasionally until the scallions are lightly browned, about 3 minutes. (Note: Do not over stir to prevent squash from getting mushy.)
4. Add the butternut squash cube mixture and scallion greens to the farro mixture. Gently stir. Adjust seasoning.
5. Stir in the basil, parsley, and pecans and serve warm or at room temperature. Alternatively, chill the farro mixture, then stir in the basil, parsley, and pecans, and serve cool.

Seasonal Recipes:

PURPLE POWER SMOOTHIE WITH CALIFORNIA PRUNES

RECIPE CREATED BY CARISSA GALLOWAY, RDN

Yield: 1 serving | Serving Size: 1 cup

INGREDIENTS:

- 1/4 cup diced California Prunes
- 1 cup baby spinach leaves
- 1/2 cup plain Greek yoghurt
- 3/4 cup pomegranate juice
- 1/2 cup frozen berries (can be a mixture of berries or just strawberries)
- 1 teaspoon honey
- 1 cup ice

METHOD:

1. Add all ingredients into a blender except ice.
2. Purée until smooth.
3. Add ice until you achieve desired consistency.
4. Enjoy!

Seasonal Recipes:

SPICY LENTIL CHILLI WITH CALIFORNIA PRUNES

RECIPE CREATED BY JACKIE NEWGENT, RDN, CDN

Yield: 6 servings | Serving Size: 1 cup

INGREDIENTS:

- 1 tablespoon avocado or sunflower oil
- 1 small or 1/2 medium red onion, diced
- 1 medium green bell pepper, diced
- 1 jalapeño pepper, minced
- 2 large garlic cloves, minced
- 1 tablespoon chilli powder
- 1/2 teaspoon ground cinnamon
- 1 1/4 cups dry brown lentils (8.5 ounces)
- 1 (15-ounce) can diced, no-salt-added fire-roasted tomatoes
- 4 cups vegetable broth (32 fluid ounces)
- 12 California Prunes, finely diced (3.5 ounces)
- 1/4 cup roughly chopped fresh cilantro leaves and tender stems

METHOD:

1. Heat the oil in a large saucepan over medium-high heat. Add the onion, bell pepper, and jalapeño and cook while stirring until the onion is lightly browned, about 8 minutes. Add the garlic, chilli powder, and cinnamon and cook while stirring until fragrant, about 30 seconds.
2. Add the lentils, tomatoes (with liquid), and broth and bring to a boil over high heat. Partially cover, reduce heat to medium-low, and simmer until lentils are just-tender, about 25 minutes.
3. Remove lid, stir in the prunes, and cook while stirring occasionally until desired consistency, about 3 to 4 minutes. Adjust seasoning.
4. Ladle into small bowls, sprinkle with the cilantro, and serve.

References

Arjmandi B, Johnson S, Pourafshar S, Navaei N, George K, Hooshmand S, Chai S, Akhavan N. Bone-protective effects of dried plum in postmenopausal women: Efficacy and possible mechanisms. Nutrients. 2017; 9: 496. doi:10.3390/nu9050496

Arjmandi BH, Khalil DA, Lucas EA, Georgis A, Stoecker BJ, Hardin C, Payton ME, Wild RA. Dried plums improve indices of bone formation in postmenopausal women. Journal of Women's Health & Gender-Based Medicine. 2002; 11: 61-68

Arthritis.org; https://www.arthritis.org/about-arthritis/types/rheumatoid-arthritis/what-is-rheumatoid-arthritis.php

Attaluri A, Donahoe R, Valestin J, Brown K, Rao S. Randomized clinical trial: dried plums (prunes) vs. psyllium for constipation. Alimentary Pharmacol Therapeutics. 2011:33; 822-8

Donovan J, Meyer AS, Waterhouse A (1998) Phenolic composition and antioxidant activity of prunes and prune juice (Prunus domestica). Journal of Agricultural and Food Chemistry. 1998; 46: 1247-1252

European Food Safety Authority; http://www.efsa.europa.eu/en/efsajournal/pub/2712

Farajian P, Katsagani M, Zampelas A. Short-term effects of a snack including dried prunes on energy intake and satiety in normal-weight individuals. Eating Behaviors 2010; 11:201–203. https://www.ncbi.nlm.nih.gov/pubmed/20434071

Furchner-Evanson A, Petrisko Y, Howarth L, Nemoseck T, Kern M. Type of snack influences satiety responses in adult women. Appetite. 2010; 54: 564-569

Gallaher C, Gallaher D. Dried plums (prunes) reduce atherosclerosis lesion area in apolipoprotein E-deficient mice. British Journal of Nutrition 2009; vol 101, issue 2, 223-239

Graef J, Rendina-Ruedy E, Crockett E, Ouyang P, Wu L, King J, Cichewicz R, Lin D, Lucas E, Smith B. Osteoclast differentiation is downregulated by select polyphenolic fractions from dried plum via suppression of MAPKs and Nfatc1 in mouse C57BL/6 primary bone marrow cells. Current Developments in Nutrition. 2017; 1: 10. https://doi.org/10.3945/cdn.117.000406

Graef J, Rendina-Ruedy E, Crockett E, Ouyang P, King J, Cichewicz R, Lucas E, Smith B. Select polyphenolic fractions from dried plum enhance osteoblast activity through BMP-2 signaling. The Journal of Nutritional Biochemistry. 2017; 55: 59-67. https://doi.org/10.1016/j.jnutbio.2017.09.014

Graef JL, Ouyang P, Wang Y, Rendina-Ruedy E, Lerner MR, Marlow D, Lucas EA, Smith BJ. Dried plum polyphenolic extract combined with vitamin K and potassium restores trabecular and cortical bone in osteopenic model of postmenopausal bone loss. Journal of Functional Foods. 2018;42: 262-270. https://www.sciencedirect.com/science/article/pii/S1756464617307788?via%3Dihub

Halloran B, Wronski T, VonHerzen D, Chu V, Xia X, Pingel J, Williams A, Smith B. Dietary dried plum increases bone mass in adult and aged male mice. Journal of Nutrition. 2010; 140: 1781-7

Hooshmand S, Chai S, Saadat R, Payton M, Brummel-Smith K, Arjmandi B. Comparative effects of dried plum and dried apple on bone in postmenopausal women. British Journal of Nutrition. 2011; 106: 923-30

Hooshmand S, Kern M, Metti D, Shamloufard P, Chai S, Johnson S, Payton M, Arjmandi B. The effect of two doses of dried plum on bone density and bone biomarkers in osteopenic postmenopausal women: a randomized, controlled trial. Osteoporosis International. 2016; 27: 2271-9. DOI 10.1007/s00198-016-3524-8

Howarth L, Petrisko Y, Furchner-Evanson A, Nemoseck T, Kern M. Snack selection influences nutrient intake, triglycerides, and bowel habits of adult women: A pilot study. Journal of the American Dietetic Association. 2010; 110: 1322-7

Keast DR, O'Neil CE, Jones JM. Dried fruit consumption is associated with improved diet quality and reduced obesity in US adults: National Health and Nutrition Examination Survey, 1999-2004. 2011 Jun;31(6):460-7. doi: 10.1016/j.nutres.2011.05.009. https://www.ncbi.nlm.nih.gov/pubmed/21745628

Lever E, Scott M, Louis P, Emery P, Whelan K. The effect of prunes on stool output, gut transit time and gastrointestinal microbiota: A randomized controlled trial. Clinical Nutrition 2018. DOI: https://doi.org/10.1016/j.clnu.2018.01.003

Livesey G (2003) Health potential of polyols as sugar replacers, with emphasis on low glycaemic properties. Nutrition Research Reviews. 16; 163–191.

Mirza F, Lorenzo J, Drissi H, Lee F, Soung D. Dried plum alleviates symptoms of inflammatory arthritis in TNF transgenic mice. Journal of Nutritional Biochemistry. 2018; 52: 54–61. https://doi.org/10.1016/j.jnutbio.2017.10.002

Sadler MJ, Gibson S, Whelan K, Ha MA, Lovegrove J, Higgs J. Dried fruit and public health – what does the evidence tell us? International Journal of Food Sciences and Nutrition. 2019; 70: 67-687. https://doi.org/10.1080/09637486.2019.1568398

Schreurs A, Shirazi-Fard Y, Shahnazari M, Alwood J, Truong T, Tahimic C, Limoli C, Turner N, Halloran B, Globus R. Dried plum diet protects from bone loss caused by ionizing radiation. Scientific Reports 2016;6: Article number: 21343. doi:10.1038/srep21343

Seidel D, Hicks K, Taddeo S, Azcarate-Peril M, Carroll R, Turner N. Dried plums modify colon microbiota composition and spatial distribution, and protect against chemically-induced carcinogenesis. The FASEB Journal. 2015; 29: 394.7

Seidel D, Taddeo S, Azcarate-Peril M, Carroll R, Turner N (2017) Dried plums modify the colon luminal metabolome in a rat model of colon carcinogenesis. The FASEB Journal. 2017; 31: 590.5

Shahnazari M, Turner R, Iwaniec U, Wronski T, Li M, Ferruzzi M, Nissenson R, Halloran B. Dietary dried plum increases bone mass, suppresses proinflammatory cytokines and promotes attainment of peak bone mass in male mice. Journal of Nutritional Biochemistry. 2016; 34: 73–82. DOI: http://dx.doi.org/10.1016/j.jnutbio.2016.04.007

Shamloufard P, Kern M, Hooshmand S (2016) Bowel function of postmenopausal women: Effects of daily consumption of dried plum. International Journal of Food Properties. 2016; 20; 3006-3013

Stacewicz-Sapuntzakis M. Dried plums and their products: Composition and health effects – An updated Review. Critical Reviews in Food Science and Nutrition. 2013; 53: 1277-302. http://www.tandfonline.com

Tinker LF, Schneeman BO, Davis PA, Gallaher DD, Waggoner DR. Consumption of prunes as a source of dietary fiber in men with mild hypercholesterolemia. American Journal of Clinical Nutrition. 1991 53; 1259-65

Wallace TC. Dried plums, prunes, and bone health: A comprehensive review. Nutrients. 2017; 9: 401. doi:10.3390/nu9040401

Yao CK, Tan HL, van Langenberg DR, Barrett JS, Rose R, Liels K, Gibson PR, Muir JG (2014) Dietary sorbitol and mannitol: food content and distinct absorption patterns between healthy individuals and patients with irritable bowel syndrome. J Hum Nutr Diet. 27; 263–275

CALIFORNIA PRUNE BOARD CONTACT INFORMATION:

2 MStudio, Talbot Yard, Market Harborough,
LE16 7NP, UK
info@californiaprunes.net

FIND CALIFORNIA PRUNES ONLINE:

CALIFORNIAPRUNES.NET

/CAforPrunes

/CAforPrunes

/CAforPrunes

HCP-0719-UK-49