



5-a-Day FOR BETTER HEALTH TRUST FRUIT/VEGETABLE JUICE Q&A

HOW FRUIT/VEGETABLE JUICE IS MADE?

How is fruit juice made?

To make fruit juice, the fruit to be used goes through a series of processes, including the selection of undamaged fruit, preparation (washing in clean water), extraction of the juice through a range of methods and finally filtering the pulp to give the clear juice. It is important to note that there are a number of different types of fruit juice available in South Africa and defined in regulations – from 100% pure fruit juice to fruit squash that contains only 24% fruit juice.

How is fruit prepared for making fruit juice?

Mature, undamaged fruit is selected while mouldy or under-ripe fruit is removed. The quality fruit is then washed in clean water and peeled, either mechanically or using sodium hydroxide (also known as caustic soda) and any stones or seeds are removed. Sometimes the fruit has to be cut to a specific size in order to fit into the liquidiser or pulper. The fruit is then generally placed in water that has been treated with a permitted anti-oxidant or lemon juice to avoid the browning that occurs when it is exposed to the air. It is now ready to be made into juice.

How is the juice extracted from fruit?

The method used to extract the juice from the fruit, depends on the type of fruit:

- Citrus fruit, apples, pears and grapes are naturally juicy and so they are mechanically pressed.
- Melon and papaya and some other fruit are steamed in order to release the juice.
- Fruit such as mango, guava, pineapple, strawberry must be pulped to extract the juice. When fruit is pulped, it is either pushed through a perforated metal plate that crushes it to a pulp or it is pulped in a liquidiser and is then filtered to remove the fruit pieces.

Does fruit/vegetable juice ferment or deteriorate when it is being extracted from the fruit?

Fruit juice starts to deteriorate as soon as it is extracted from the fruit as a result of enzyme action and bacterial spoilage. Extracted fruit juice that is left to stand for long periods out of a fridge will start to ferment and discolour. To avoid fermentation, deterioration or discolouring, the best quality fruit juice is made by minimising the time between the extraction of the juice and bottling/canning.

What is the difference between fruit pulp and fruit puree?

Fruit pulp is produced by 'pulverising' the entire fruit and then removing hard, inedible bits afterwards, while a fruit puree is produced from the 'liquidising' only the edible parts of the fruit. In the making of fruit juice, fruit pulp is generally used.

Why is some fruit juice cloudy while other fruit juice is clear?

The juice extracted from the fruit in the process of making fruit juice, is naturally cloudy or opaque but it can be made clear by filtering the juice. The extracted juice or pulp is filtered through a muslin cloth or a stainless steel filter and in some cases enzymes are used to clarify the juice. The reason that fruit juice is filtered is because some consumers prefer a clear fruit juice.

How is fruit/vegetable juice preserved? Why doesn't it spoil when it is stored on the shelf in the supermarkets?

All fruit/vegetable juices, except freshly squeezed fruit juice, are either pasteurised or undergo ultra heat treatment (UHT) to preserve them. The heat processing destroys the enzymes that are naturally found in the fruit/vegetables, which can cause the juice to spoil and discolour and also kills any spoilage micro-organisms and pathogens that may be found in fruit/vegetables. Modern pasteurisation has minimal harmful effects on the taste, physical and nutritional content of the juice and the UHT process is highly controlled to produce a product of consistent quality. The heat process may however destroy some of the heat-sensitive nutrients (such as vitamin C and the B vitamins), but these can be restored to the product, as long as they are correctly labelled.

In the case of fresh fruit juice, which is usually squeezed from the fruit at the point of sale, the law requires that for food safety reasons, no more than 2 hours can elapse between the extraction of the juice and the sale and consumption of the juice.

Does the heat treatment of fruit/vegetable juice destroy the vitamins in the fruit/vegetable juice?

Heat-sensitive nutrients such as vitamin C and the B vitamins may be partially destroyed during the heat treatment used to preserve the fruit/vegetable juice, but these nutrients are legally allowed to be restored to the product, as long as they are correctly labelled. The benefit of microbiologically safe fruit/vegetable juice, that is the purpose of the heat treatment, outweighs the loss of some of the vitamins. 5-a-Day allows for 1 serving, of your minimum 5 servings of vegetables and fruit a day, to come from fresh fruit/vegetable juice or 100% pure, unsweetened fruit/vegetable juice (either still or carbonated). The remaining minimum 3 servings must come from fresh or frozen.

TYPES OF FRUIT/VEGETABLE JUICE

What types of fruit/vegetable juice are there and what is the difference between them?

In South Africa, there are specific regulations relating to fruit/vegetable juices and what they may contain in terms of additives and preservatives, and that sets definitions for what a fruit/vegetable juice must be called, based on its composition. It is important to note that there is a large variation from 'fresh fruit/vegetable juice' that is 100% fruit/vegetable juice that has been freshly squeezed, to 'fruit squash' that contains only 24% fruit juice. Only fresh fruit/vegetable juice and 100% pure unsweetened (still or carbonated) fruit/vegetable juice is permitted to be included as a single 200mL serving towards your 5-a-Day goal.

- **Fresh Fruit Juice:** This is fruit juice that is generally freshly squeezed in the store where it is sold and has no additives, so is preserved only by refrigeration. For food safety reasons, the regulations in South African, only allow a fruit juice to be called a 'fresh fruit juice', if no more than two hours elapses between the time the juice is extracted from the fruit and the time that it is sold or consumed. 5-a-Day allows for 1 serving of your daily minimum of 5 servings of vegetables and fruit to come from a 200mL serving of fresh fruit/vegetable juice or 100% pure unsweetened fruit/vegetable juice – the remaining servings should come from fresh or frozen vegetables and/or fruit.

- 100% Pure Fruit Juice: This is undiluted, unsweetened fruit/vegetable juice, puree or concentrate usually extracted from the fruit/vegetable by mechanical means. Acidifying agents permitted by the regulations, and in some cases carbon dioxide, are then added. Finally, it is heat treated by pasteurisation or ultra heat treatment (UHT) to preserve the juice. This fruit/vegetable juice can also be made by adding water and natural essence, natural flavourants or nature identical flavourants to fruit/vegetable concentrate, to reconstitute the juice to its original standard strength. It is important to note that no extra sugar is added to this juice. 5-a-Day allows for 1 serving of your daily minimum of 5 servings of vegetables and fruit to come from a 200mL serving of fresh fruit/vegetable juice or 100% pure unsweetened fruit/vegetable juice – the remaining servings should come from fresh or frozen vegetables and/or fruit.
- 100% Sweetened Fruit Juice: In these juices, varying amounts of 100% pure fruit juice is mixed with up to 5% (m/m) of sweeteners that are permitted for use in the regulations. This type of fruit juice is not permitted as part of the 5-a-Day programme.
- Fruit Nectar: This is a mixture of 20% to 90% fruit pulp or concentrate together with sugar and water (sugar syrup), in order to give a final sugar level in the fruit juice of about 7.5% – 12.5%. The percentage of pulp or concentrate that has to be used in a fruit nectar is specified in the regulations for each type of fruit. This type of fruit juice is not permitted as part of the 5-a-Day programme.
- Fruit Squash: Fruit squash, according to the South African regulations, contains 24% of fruit juice mixed with sugar syrup to give a final sugar concentration of about 40%. Fruit squashes are diluted with water prior to use. As the fruit squash bottle is opened, partly used and then stored, fruit squashes always contain a preservative. This type of fruit juice is not permitted as part of the 5-a-Day programme.

Does fruit juice contain sugar?

Yes, all fruit juice contains sugar because fruit itself naturally contains sugar. The natural sugar content of fruit is between 8% and 12%, but the actual levels vary from fruit to fruit and with the stage of ripeness of the fruit as well as the geographical location where the fruit was grown.

Some form of sugar, based on the amount already present in the juice, is also added to the fruit pulp when making commercial fruit juice and serves two main purposes. The first is that deflavouring apple, pear or grape juice is added to fruit pulps such as guava and mango to obtain a drinkable fruit juice. This is because these fruits generally contain so much pulp, that they are too thick to drink and so need to be diluted. Deflavouring apple, pear or grape juice is obtained during the process of concentration of the juice, as the flavour compounds are volatile and so are lost during the first steps of concentration. The second reason for adding deflavouring apple, pear or grape juice, is because many consumers demand a sweeter product than the natural juice sweetness. Sucrose, usually in the form of a sugar syrup, is used instead of deflavouring juice to obtain a cheaper beverage such as a nectar or fruit drink. The regulations have a set sugar content for the different types of fruit juice.

5-a-Day only allows a daily single 200mL serving of fresh fruit/vegetable juice and 100% pure unsweetened fruit/vegetable juice as part of the 5-a-Day programme.

FRUIT JUICE REGULATIONS

Are their regulations regarding fruit juice in South Africa?

Various legislation regulates the manufacture and labelling of fruit juice in South Africa. The Department of Agriculture, manage a regulation relating to the classification, packing and marking of fruit juice and drinks. The Directorate of Food Control manages the Foodstuffs, Cosmetics and Disinfectants Act, that includes a number of regulations that impact on fruit juice manufacturers including labelling regulations and regulations that set limits for the use of various additives in fruit juices.

The 5-a-Day for Better Health TRUST has taken full cognisance of these regulations and definitions when considering fruit/vegetable juice for inclusion in the 5-a-Day programme and based on the legal definition, only fresh fruit/vegetable juice and 100% pure unsweetened fruit/vegetable juice are eligible for 5-a-Day endorsement. 5-a-Day also requires that all users of the 5-a-Day name or logo are fully regulatory compliant.

What do the different names on fruit juices actually mean?

In South Africa, the regulations allow for six different types of fruit juice/drinks. The name is determined based on the composition of the fruit juice. Only two of these, fresh fruit juice and 100% pure unsweetened fruit juice, are approved to be included as part of the 5-a-Day programme:

CLASS NAME	CRITERIA
Fresh Fruit Juice	<ul style="list-style-type: none"> • natural juice extracted from fruit • contains no additives • is preserved only by refrigeration • is free from pips, peel or foreign matter • is intended for sale and consumption within 2 hours of extraction.
100% Pure (or Unsweetened) Fruit Juice	<ul style="list-style-type: none"> • natural juice extracted from fruit • preserved in a permitted manner (usually heat treatment) • contains no additives except malic & ascorbic acids, carbon dioxide, added nutrients and permitted flavourants or fruit essence • must contain 100% undiluted fruit juice.
100% Sweetened Fruit Juice	<ul style="list-style-type: none"> • natural juice extracted from fruit • contains permitted natural or other sweeteners (<5% m/m) • preserved in a permitted manner (usually heat treatment) • contains no additives except malic & ascorbic acids, carbon dioxide, added nutrients and permitted flavourants or fruit essence • the amount of 100% undiluted fruit juice used varies depending on the fruit, from 70% – 90%.
Nectar	<ul style="list-style-type: none"> • natural juice extracted from fruit • contains permitted natural or other sweeteners (<5% m/m) • preserved in a permitted manner • contains no additives except malic & ascorbic acids, carbon dioxide, added nutrients and permitted flavourants or fruit essence • the amount of fruit juice in the ready-to-drink form varies depending on the fruit, from 12.5% – 50%.

Squash	<ul style="list-style-type: none"> • natural juice extracted from fruit • contains permitted natural or other sweeteners (<5% m/m) • preserved in a permitted manner • contains no additives except malic & ascorbic acids, carbon dioxide, added nutrients and permitted flavourants or fruit essence • must contain a minimum of 24% fruit juice in the undiluted form.
Drink	<ul style="list-style-type: none"> • natural juice extracted from fruit • contains permitted natural or other sweeteners (<5% m/m) • preserved in a permitted manner • contains no additives except malic & ascorbic acids, carbon dioxide, added nutrients and permitted flavourants or fruit essence • must contain a minimum of 6% fruit juice in the ready-to-drink form.

FRUIT JUICE AND HEALTH

How many vegetables and fruit should we be eating for optimal health and disease prevention?

Globally it is recognised that we all need to be eating at least 400g of a variety of vegetables and fruit every day – this equates to 5 portions of about 80g a portion. In South Africa, the 5-a-Day for Better Health TRUST encourages the inclusion of at least (the minimum) 5 servings of a variety of vegetables and fruit each day. 5-a-Day has strict criteria for products that can be part of the 5-a-Day programme and allows for one 200mL serving of fresh fruit/vegetable juice or 100% pure unsweetened fruit/vegetable juice each day. The remaining 3 minimum servings of vegetables and fruit must come from fresh or frozen.

How does the 5-a-Day recommendation that allows for the inclusion of one 200mL serving of fresh fruit/vegetable juice or 100% pure unsweetened fruit/vegetable juice as part of the 5-a-Day programme, fit in with other healthy eating recommendations?

The recommendations made by the 5-a-Day for Better Health TRUST in South Africa are in line with the food-based dietary guideline messages for all people over the age of two. These recommendations aim to be positive, based on the usual dietary habits of all population groups and therefore also practical, culturally sensitive and 'do-able'. Including one 200mL serving of fresh fruit/vegetable juice or 100% pure unsweetened fruit/vegetable juice (still or carbonated) is a great way of getting 1 serving of your minimum 5 servings of vegetables and fruit a day. It can easily be included at breakfast or in a lunch box. At least 3 of your 5-a-Day should come from fresh and frozen vegetable and fruit options.

Do fruit/vegetables juices count as part of the 5-a-Day programme?

Yes, but only for one of your 5-a-Day servings and only 200mL of fresh or 100% pure unsweetened (still or sparkling) fruit/vegetable juice. 5-a-Day will always promote that at least 3 of the minimum 5 servings of vegetables and fruit should come from fresh or frozen and that a wide variety of vegetables and fruit should be included as part of 5-a-Day.

How much fruit/vegetable juice can count as a serving of vegetables and fruit?

5-a-Day counts one 200mL serving of fresh or 100% pure unsweetened fruit/vegetable juice (still or carbonated) towards your daily minimum 5 servings of a variety of vegetables and fruit. Only 1 serving of your 5-a-Day can come from fruit/vegetable juice – the other minimum 3 servings must come from fresh or frozen vegetable and fruit options. The main reason for only allowing a single 200mL serving of fresh fruit/vegetable juice or 100% pure unsweetened fruit/vegetable juice (still or carbonated) as part of your 5-a-Day, is that juice lacks the fibre component of fresh/frozen vegetables and fruit and in some cases there is a slight loss in some of the vitamins.

Can I get all my 5-a-Day servings from fruit/vegetable juice?

No, the 5-a-Day for Better Health TRUST recommends that at least 3 of the 5 minimum daily servings of vegetables and fruit must come from fresh or frozen options. The 5-a-Day programme allows for only one of the minimum 5 servings of vegetables and fruit to be in the form of a 200mL serving of a fresh fruit/vegetable juice or 100% pure unsweetened fruit/vegetable juice - the focus must always be on eating plenty of fresh or frozen vegetables and fruit.

Does 5-a-Day allow for sparkling/fizzy/carbonated fruit/vegetable juice to be drunk?

Yes, 5-a-Day allows for 1 of your minimum 5 servings of vegetables and fruit each day to come from a 200mL serving of fresh fruit/vegetable juice or 100% pure unsweetened fruit/vegetable juice – still or carbonated. It appears however, that carbonation raises a number of health concerns amongst both the consumer and health professionals, but a detailed scientific literature review shows that these concerns are generally unfounded. The choice between drinking still or carbonated fresh fruit/vegetable juice or 100% pure unsweetened fruit/vegetable juice is therefore left to the individual. 5-a-Day promotes that at least 3 of your daily vegetable and fruit servings must come from fresh or frozen options.

Do sparkling (fizzy/carbonated) drinks play a role in cancer?

Limited scientific research shows that there is may be a link between carbonated beverage consumption and laryngeal and stomach cancer, although the scientific support of such a link appears weak and more research is needed from larger, well designed studies to confirm this.

5-a-Day believes that there is insufficient evidence to support the carbonation and cancer connection and highlights that eating at least 5 servings of a variety of vegetables and fruit, one of which can be a 200mL serving of a carbonated (or non-carbonated) fresh fruit/vegetable juice or 100% pure unsweetened fruit/vegetable juice, is in fact possibly cancer preventative.

Do sparkling (fizzy/carbonated) drinks cause reflux?

No association has been found in epidemiologic studies between carbonated beverages and gastroesophageal reflux disease (GERD) or between carbonated soft drinks and oesophageal neoplasms. Based on the current scientific research, 5-a-Day allows for one 200mL serving of carbonated (or still) fresh fruit juice or 100% pure unsweetened fruit juice to count as one serving towards the 5-a-Day goal. At least 3 servings a day should come from fresh or frozen options.

Can sparkling (fizzy/carbonated) drinks cause stomach discomfort?

The influence of sparkling beverages on stomach function appears related to both mechanical and chemical effects. The research shows that symptoms related to a gastric mechanical distress appear only when drinking more than 300mL of a carbonated fluid. A chemical effect, related to carbon dioxide, may slightly increase the hydrochloric acid in the stomach, which could have an effect on the digestive process or worsen acid related disease, however the research in this area is

very limited and additional studies are needed to clarify these aspects. Based on the current scientific research, 5-a-Day allows for one 200mL serving of carbonated (or still) fresh fruit juice or 100% pure unsweetened fruit juice to count as one serving towards the 5-a-Day goal. At least 3 servings a day should come from fresh or frozen options.

Do sparkling (fizzy/carbonated) drinks cause bloating/flatulence?

A review of the latest literature shows that there is no clear evidence that the carbon dioxide ingested, when consuming a sparkling drink, plays any pathophysiological role in the intestinal tract since it is almost totally absorbed before it reaches the lower digestive tract. Based on the current scientific research, 5-a-Day allows for one 200mL serving of carbonated (or still) fresh fruit juice or 100% pure unsweetened fruit juice to count as one serving towards the 5-a-Day goal. At least 3 servings a day should come from fresh or frozen options.

Do sparkling (fizzy/carbonated) drinks cause dental caries and erosion?

Dental caries occur due to demineralisation of enamel and dentine by organic acids formed by *bacteria* in dental plaque through the anaerobic metabolism of sugars derived from the diet. The term 'sugars derived from the diet in this instance is defined as 'all mono and disaccharides added to foods by manufacturer, cook or consumer, plus sugars naturally present in honey, fruit juices and syrups.'

Dental erosion is the progressive irreversible loss of dental hard tissue that is chemically etched away from the tooth surface by extrinsic and/or intrinsic acids and/or chelation by a process that does not involve bacteria. The critical pH of enamel is ~5.5 and therefore any drink or food with a lower pH may cause erosion.

This means that carbonated fruit juice is potentially cariogenic and erosive, not due to carbonation but to the natural sugar content and acidity level. Other carbonated beverages such as sports and energy drinks are potentially as cariogenic/erosive or more so than carbonated fruit juice. Key when including fruit juice in the diet is the frequency of consumption, manner of consumption, quantity and whether included as part of a meal or drunk alone. 5-a-Day limits its fresh fruit/vegetable juice and 100% pure unsweetened fruit/vegetable juice recommendation to one 200mL serving of fruit/vegetable juice (carbonated or non-carbonated) a day and highlights the importance of good dental hygiene practices.

I have heard that carbonated beverages negatively affect my bone health – is this true?

Although links between carbonated soft drinks and decreased bone mineral density and increased risk of bone fracture have been suggested, it appears that this only applies in the case of colas and not all carbonated beverages. Scientists suggest that the role of carbonated beverages in calcium deficiency and reduced bone mineral density is primarily that of displacing milk and other sources of calcium. 5-a-Day encourages the inclusion of at least 5 servings of a variety of vegetables and fruit each day, that can include one 200mL serving of fresh fruit/vegetable juice or 100% pure unsweetened fruit/vegetable juice, as part of a balanced diet that also meets the other guidelines for healthy eating as outlined in the South African Food Based Dietary Guidelines and this includes eating foods that are a good source of calcium such as dairy.

Is fruit/vegetable juice fattening?

To gain excess body fat, we must eat and drink more kilojoules than the body actually needs. The kilojoules that aren't needed for bodily functions are then stored as fat. So to lose weight, we must ensure that we eat and drink fewer kilojoules than we need. Bearing this in mind, any food or drink that contains kilojoules and that is consumed in excessive quantities can lead to weight gain.

Fresh fruit/vegetable juice and 100% pure unsweetened fruit/vegetable juice is higher in kilojoules than whole fruit, but fresh fruit/vegetable juice and 100% pure unsweetened fruit/vegetable juice can still be enjoyed in controlled quantities as part of a balanced eating plan. In the design of diabetic or weight loss diets, in which carbohydrate and energy exchanges are precisely calculated, the type of vegetables and fruit, but also the number of servings and the size of the serving in context of the total diet (other foods such as whole grains and cereals providing additional fibre, the amount of water, etc.) will influence the recommendations for these specialised diets. A registered dietitian has the necessary qualifications to assist in special diet planning.

It must be remembered that everyone, including those on a weight loss programme, should eat at least 5 servings of a variety of vegetables and fruit a day for better health, but the focus should be on fresh and frozen vegetables and fruit.

NUTRITIONAL CONTENT OF FRUIT/VEGETABLE JUICES

What is the nutritional difference between fruit/vegetable and fruit/vegetable juice?

The process of 'manufacturing' a fruit/vegetable juice changes the composition and nutritive value of the product when compared to the original fruit/vegetable. The major change is the removal of the dietary fibre component as part of the pulp, this means that fruit/vegetable juice is more kilojoule-dense than whole fruit/vegetable, and indirectly also slightly alters the vitamin and mineral density. This is because some of the vitamins and minerals may also be removed as part of the pulp while others could be partially destroyed by the processing.

5-a-Day allows for only one 200mL serving of carbonated (or still) fresh fruit/vegetable juice or 100% pure unsweetened fruit/vegetable juice to count as one serving towards the 5-a-Day goal. At least 3 servings a day should come from fresh or frozen options.

Why can't we simply exchange fruit/vegetables for fruit/vegetable juice?

Fruit/vegetable juice due to how it is made is not as just another version of the fruit/vegetable(s) it is made from and therefore it is not an exact nutrient exchange for the original intact fruit/vegetable. A 200mL serving of fruit/vegetable juice has a higher energy density and lower dietary fibre content than 80 grams of the original fruit/vegetable. Therefore fruit/vegetable juice cannot be seen as replacing fruit/vegetable, especially for people who have diabetes and/or who are restricting their kilojoule intake to promote weight loss.

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In the design of diabetic or weight loss diets, in which carbohydrate and energy exchanges are precisely calculated, the type of vegetables and fruit, but also the number of servings and the size of the serving in context of the total diet (other foods such as whole grains and cereals providing additional fibre, the amount of water, etc.) will influence the recommendations for these specialised diets. A registered dietitian has the necessary qualifications to assist in special diet planning.

Why is the serving size for fruit/vegetable juice 200mL?

5-a-Day includes a 200mL serving of fresh fruit/vegetable juice or 100% pure unsweetened fruit/vegetable juice as one of your minimum 5 servings of a variety of vegetables and fruit. It is important to know that the recommendations made by the 5-a-Day for Better Health TRUST are in line with the food-based dietary guideline messages for all individuals over 2 years of age, which aim to be positive, based on the usual dietary habits of all population groups and therefore also practical, culturally sensitive and 'do-able'. The serving size was defined as 200mL, which is a smallish glass of juice, in order to be practical and achievable.

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Why does fruit/vegetable juice only count as one of the 5-a-Day servings?

The reason that 5-a-Day only allows 1 serving of your daily minimum of 5 servings of vegetables and fruit to be fresh fruit/vegetable juice or 100% pure unsweetened fruit/vegetables juice is because fruit/vegetable juice has a higher energy density and lower fibre content and possibly slightly lower vitamin and mineral compared to the whole fruit. At least 3 servings should come from fresh and frozen vegetables and fruit in order to ensure sufficient dietary fibre, vitamins and minerals.

Does fruit/vegetable juice contain sugar?

Yes, fruit naturally contains around 8% -12% sugar, predominantly in the form of fruit sugar (fructose), but the level varies depending on the type of fruit, the ripeness of the fruit and the location where it was grown.

Is sugar ever added to fruit juice?

Fruit juices are sold either as pure (unsweetened) or sweetened. Once the amount of sugar already present in the juice is taken into account, sugar may be added to the fruit pulp for two reasons:

1. To thin the pulp. Fruit pulps such as guava and mango are too thick to drink so de flavoured apple, pear and grape juice is added to thin the pulp into a drinkable liquid.
2. To increase the sweetness. De flavoured apple, pear or grape juice may be added as many consumers prefer a sweeter fruit juice. Sucrose may be used instead of de flavoured juice to reduce costs.

Why does 5-a-Day allow fruit/vegetable juices to be carbonated (sparkling/fizzy) or non-carbonated (still)?

5-a-Day follows an evidence based approach to all its recommendations. Based on the current scientific evidence, there is no reason to believe that the current level of carbonation in fruit/vegetable juices is linked to any adverse health effects. As a result, the 200mL serving of fresh fruit/vegetable juice or 100% pure unsweetened fruit/vegetable juice, that 5-a-Day allows to be counted as one serving towards your minimum 5 servings a day goal, can be either carbonated or non-carbonated according to personal taste preference.

Are there any people who shouldn't drink fruit/vegetable juice?

All individuals should aim to eat at least 5 servings of a variety of vegetables and fruit for better health and disease prevention; however diets that are designed to help people manage their diabetes and/or their weight are precisely calculated for their carbohydrate and energy content. In these cases, the type of vegetables and fruit, but also the number of servings and the size of the serving in context of the total diet (other foods such as whole grains and cereals providing additional fibre, the amount of water, etc.) will influence the recommendations for these specialised diets. A registered dietitian has the necessary qualifications to assist in special diet planning.

Is fruit/vegetable juice fattening?

To gain excess body fat, we must eat and drink more kilojoules than the body actually needs. The kilojoules that aren't needed for bodily functions are then stored as fat. So to lose weight, we must ensure that we eat and drink fewer kilojoules than we need. Bearing this in mind, any food or drink that contains kilojoules and that is consumed in excessive quantities can lead to weight gain.

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It must be remembered that everyone, including those on a weight loss programme, should eat at least 5 servings of a variety of vegetables and fruit a day for better health, but the focus should be on fresh and frozen vegetables and fruit.

CARBONATION OF FRUIT/VEGETABLES JUICES

What is carbonation of fruit/vegetable juice?

Carbonation of fruit/vegetable juice occurs when carbon dioxide (CO₂) is dissolved in the fruit juice. This process adds a 'fizz' to the fruit juice. Carbon dioxide is introduced to the fruit juice at the filling stage, after which pasteurisation or UHT occurs inside the container.

It is interesting to know that aside from the natural fruit flavours, fizzy fruit juice beverages have a distinct carbonated taste. It was initially thought that the bubbles popping is what accounted for the tingly taste of carbonation however this has been questioned as carbonated beverages consumed in a pressurized environment, in which no bubbles formed, produce the same taste. Researchers now believe that carbonation is tasted on the tongue by the same receptors that detect sourness. Yet, carbon dioxide doesn't really taste sour and so it would seem that the ultimate perception of carbonation may involve other senses as well, including the mechanical stimulus of the popping bubbles.

A detailed scientific literature review shows that most of the consumers and health professionals concerns around carbonation and health are generally unfounded therefore, 5-a-Day allows for 1 of your minimum 5 servings of vegetables and fruit each day to come from a 200mL serving of fresh fruit/vegetable juice or 100% pure unsweetened fruit/vegetable juice – still or carbonated.

What happens to the carbon dioxide consumed in fruit/vegetable juices?

Carbon dioxide (CO₂) plays a key role in the body and is produced by every tissue and seems to act on every organ. The level of carbon dioxide in the body is regulated by the release of excess molecules through the lungs. With regards to the amount of carbon dioxide ingested through consuming carbonated beverages, with the pressures used in commercial beverages, the volume of gas will be 3-5 times the volume of the liquid. As the amount of carbon dioxide dissolved in a beverage is dependent on the pressure and temperature of the beverage, it is difficult to determine the amount ingested. Most of the carbon dioxide in a carbonated beverage does not reach the stomach as much is lost in the fizz when the can or bottle is opened (because of the sudden drop in pressure), and some combines with swallowed air to cause belching. The small amount of carbon dioxide that does reach the digestive tract is readily and rapidly absorbed through the wall of the gastrointestinal system. The gas ingested influences the alimentary tract through the nervous system and by direct mechanical and chemical means.

A detailed scientific literature review shows that most of the consumers and health professionals concerns around carbonation and health are generally unfounded. 5-a-Day therefore allows for 1 of your minimum 5 servings of vegetables and fruit each day to come from a 200mL serving of fresh fruit/vegetable juice or 100% pure unsweetened fruit/vegetable juice – still or carbonated.

Is carbon dioxide required by the body?

Carbon dioxide (CO₂) plays a key role in the body and is produced by every tissue and seems to acts on every organ. It regulates body functions by influencing the blood's acid-base balance, controlling respiration and exerting an influence on the heart and the peripheral circulation. The level of carbon dioxide in the body is regulated by the release of excess molecules through the lungs.

With regards to the amount of carbon dioxide ingested through consuming carbonated beverages, with the pressures used in commercial beverages, the volume of gas will be 3-5 times the volume of the liquid. As the amount of carbon dioxide dissolved in a beverage is dependent on the pressure and temperature of the beverage, it is difficult to determine the amount ingested. Most of the carbon dioxide in a carbonated beverage does not reach the stomach as much is lost in the fizz when the can or bottle is opened (because of the sudden drop in pressure), and some combines with swallowed air to cause belching. The small amount of carbon dioxide that does reach the digestive tract is readily and rapidly absorbed through the wall of the gastrointestinal system. The gas ingested influences the alimentary tract through the nervous system and by direct mechanical and chemical means.

A detailed scientific literature review shows that most of the consumers and health professionals concerns around carbonation and health are generally unfounded. 5-a-Day therefore allows for 1 of your minimum 5 servings of vegetables and fruit each day to come from a 200mL serving of fresh fruit/vegetable juice or 100% pure unsweetened fruit/vegetable juice – still or carbonated.

Are carbonated (fizzy/sparkling) fruit/vegetables juices bad for you?

A detailed scientific literature review shows that most of the consumers and health professionals concerns around carbonation and health are generally unfounded therefore, 5-a-Day therefore allows for 1 of your minimum 5 servings of vegetables and fruit each day to come from a 200mL serving of fresh fruit/vegetable juice or 100% pure unsweetened fruit/vegetable juice – still or carbonated.

Fruit/vegetable juice can be sold with or without carbon dioxide added (carbonation). Carbonation of fruit juices occurs when carbon dioxide is dissolved in the fruit juice resulting in a 'fizz.' Most of the

carbon dioxide in a carbonated beverage does not reach the stomach as much is lost in the fizz when the can or bottle is opened (because of the sudden drop in pressure) or lost by burping. The small amount of carbon dioxide that does reach the digestive tract is readily and rapidly absorbed through the wall of the gastrointestinal system.

Carbon dioxide plays a key role in the body and is produced by every tissue and seems to acts on every organ. It regulates body functions, such as the blood's acid-base balance; controlling respiration and affecting circulation. The body maintains an ideal level of carbon dioxide by releasing excess molecules via the lungs.

Is the carbon dioxide in fizzy (carbonated/sparkling) fruit/vegetable juices bad for you / unhealthy?

Carbon dioxide (CO₂) actually plays a key role in the body and is produced by every tissue and seems to acts on every organ. It regulates body functions, such as the blood's acid-base balance; controlling respiration and affecting circulation. The body maintains an ideal level of carbon dioxide by releasing excess molecules via the lungs. A review of the current scientific literature shows that health concerns of many consumers and health professionals, regarding carbonation are generally unfounded. 5-a-Day therefore, allows for one 200mL serving of carbonated (or still) fresh fruit/vegetable juice or 100% pure unsweetened fruit/vegetable juice to count as one serving towards the 5-a-Day goal. At least 3 servings a day should come from fresh or frozen options.

Do fizzy (carbonated/sparkling) fruit/vegetable juices damage teeth or dissolve the tooth enamel?

Carbonated fruit/vegetable juice has the potential to cause tooth decay and erode enamel because of the natural sugar content and acidity level, not because of the carbonation. Other carbonated drinks such as sports and energy drinks are potentially as cariogenic/erosive or more so than carbonated fruit/vegetable juice.

Fruit/vegetable juices can be included in a healthy eating plan, provided that the frequency of consumption, manner of consumption, quantity and whether it is consumed with a meal or in between meals.

5-a-Day limits its fresh fruit/vegetable juice and 100% pure unsweetened fruit/vegetable juice recommendation to one 200mL serving of fruit/vegetable juice (carbonated or non-carbonated, depending on taste preference) a day and highlights the importance of good dental hygiene practices.

Can fizzy (carbonated/sparkling) fruit/vegetable drinks destroy bone?

The current scientific research shows that any link between carbonated soft drinks and decreased bone mineral density and increased risk of bone fracture appear to only apply to colas and not all carbonated beverages. However, if carbonated beverages take the place of calcium-rich foods and drinks in the diet, bone mineral density may be reduced. 5-a-Day encourages the inclusion of at least 5 servings of a variety of vegetables and fruit each day, that can include one 200mL serving of fresh fruit/vegetable juice or 100% pure unsweetened fruit/vegetable juice, as part of a balanced diet that also meets the other guidelines for healthy eating as outlined in the South African Food Based Dietary Guidelines and this includes eating foods that are a good source of calcium such as dairy.

For more information on 5-a-Day visit www.5aday.co.za