



Apple : Varieties and its health benefits

DINESH A. CHAUDHARY, MAHESH R. CHAUDHARY AND ASHWIN L. JUDAL

ABSTRACT : The apple is a pomaceous fruit and has the scientific name, *Malus domestica*. It is part of the rose family rosaceae and is a perennial fruit. China is the world's largest producer of apples. The most common varieties of apples are red delicious and Granny Smith. There are some commercial apple products available in market today *i.e.* apple candy, apple jam, apple jelly, apple juice etc. Apples are a great source of fibre pectin which helps control insulin levels and acts as anti cholesterol. Apples are a rich source of phytochemicals such as quercetin which acts as anti cancer, anti cholesterol and reduced risk of asthma and diabetes. This paper will discuss on apple varieties, its products and health benefits.

KEY WORDS : Apple, Varieties, Products, Pectin, Phyto-chemicals

HOW TO CITE THIS PAPER : Chaudhary, Dinesh A., Chaudhary, Mahesh R. and Judal, Ashwin L. (2014). Apple : Varieties and its health benefits. *Res. J. Animal Hus. & Dairy Sci.*, 5(1) : 35-38.

INTRODUCTION

Apple (*Malus domestica*) is commercially the most important temperate fruit and is fourth among the most widely produced fruits in the world after banana, orange and grape. China is the largest apple producing country in the world. World apple production in 2011-12 is estimated to be a record of 65.23 million tons. This volume is 4 per cent higher than the year before and 11 per cent up compared to the average of the last five seasons (USDA, 2012). The India highlights major Apple producing states like Himachal Pradesh, Uttarakhand, Arunachal Pradesh, Nagaland, Sikkim, and Tamil Nadu.

Apple is the pomaceous fruit of the apple tree, species *Malus domestica* in the rose family (Rosaceae). The apple tree originated in Central Asia, in an area between the Caspian Sea and Black Sea. It is one of the most widely cultivated tree fruits and the most widely known of the many members of genus *Malus* that are used by humans. An apple grows on small, delicious trees and is called "The

king of delicious fruit" due to its beautiful shape, attractive color and very good taste. Apple In taste is tasty and juicy and has various tastes from sour to sweet. The apple tree usually grows to about 5-12 m in height.

The Major Constituents of Apple Fruits per 100g are as below:

Constituent (g)	Values	Constituent (mg)	Values	Constituent (mg)	Values
Water	85.56	Calcium	6	Iron	0.12
Protein	0.26	Phosphorus	14	Potassium	107
Fat	0.17	Thiamin	0.017	Magnesium	5
Sugar	10.39	Riboflavin	0.026	Folate (µg)	3
Dietary fibre	2.4	Niacin	0.091	Carotene (µg)	45
Carbohydrate	13.81	Vitamin C	4.6	Energy(Kcal)	52

Source: USDA, 2012

Famous varieties of apple:

Red delicious:

The red delicious originated at an orchard in 1880 and was originally called the "Hawkeye" before Stark Brother Nurseries bought the rights and changed the name. It is good for eating fresh and in salads, but it is not good for baking. It has a rich red colour and is sometimes streaked with yellow. They are sweet and juicy apples and is available August through

MEMBERS OF RESEARCH FORUM

Address for correspondence :

Dinesh A. Chaudhary, Department of Dairy Engineering, SMC College of Dairy Science, Anand Agricultural University, ANAND (GUJARAT) INDIA

Associated Authors' :

Mahesh R. Chaudhary and Ashwin L. Judal, Department of Dairy Engineering, SMC College of Dairy Science, Anand Agricultural University, ANAND (GUJARAT) INDIA

November.

Granny smith:

Granny Smith apples were grown from a chance seed thrown out by Mrs. Thomas (Granny) Smith in Australia. It is red and yellow and is a relatively new variety. It is sweet and crisp it makes an excellent snacking and is good for salads, sauces and freezing. This apple is also good for use in baking, but it is not recommended for use in pies.

Cortland apple:

Cartland apple is introduced by New York State Agricultural Experiment Station since 1915. It is a sweet red apple over a greenish-yellow background that comes with just a trace of tartness. This type of apple is a good choice for snacks, salads, pies, sauces, baking and good for freezing. It is available from September to April.

Fuji apple:

Fuji apple is originated from Japan, developed by Tohoku Research Station since 1962. It is a sweet, reddish-pink apple. This apple is a good choice for snacks and good in salads, pies, sauces and baking. It is not a good apple for freezing and is available from October to August.

Gala apple:

This apple originates from New Zealand. It has pinkish stripes over a yellow background. This apple is sweet and is excellent for snacks, salads, sauces and good for pies and baking but it wouldn't recommend as freezing apple. Gala apples are available from September to May.

Golden delicious:

Golden delicious is developed by Anderson Mullins, West Virginia (United States); 1890. It is consistently sweet with a silky texture and crisp, thin skin. Yellow, sometimes with a bright pink blush if cool nights precede harvest. These apples are excellent for pies, sauce and baking; great for fresh eating.

Ginger gold:

Ginger gold is developed by Ginger Harvey, Nelson County, Virginia (United States); 1960. It has 5 distinct crowns on the base and is deep red to crimson in colour. It is medium in sweetness with juicy creamy white flesh and a highly aromatic flavour. Texture of ginger gold is softer than some other varieties which make them ideal for young children.

Honey crisp:

Honey crisp is a modern apple variety, developed by university of Minnesota in 1960s and introduced to market in the 1990s-sometimes trademarked as "Honey crunch". It

is crisp and juicy, with freckled green skin and sweetly tart flesh. It is one of the best choices for eating and cooking. It can be stored in the fridge for maximum of 240 days.

Jonathan:

Jonathan is an old American apple variety, discovered in 1820s and introduced to market in the 1860s. It is spicy and fragrant, juicy, sweet-tart is good for cooking, except when cooked whole and is excellent for snacks. It can be stored in the refrigerator for a good 120 days.

Jonagold:

Jonagold is high quality American apple, developed by New York State Agricultural Experiment Station in 1940s and introduced to market in the 1940s. It is large in size with sweet, juicy crisp cream coloured flesh and a refreshing taste. Jonagold has a bright red skin over a yellow base and is a cross between the Jonathan and Jonagolds and available from mid March – August in Australia.

Rome beauty:

Rome beauty is popular apple variety, originated from Ohio, United States and introduced to market in 1816s. It is a mildly tart red apple, which makes an excellent baking apple. It is as good for use in pies, or sauces as it is for making salads, eating as a snack, as well as freezing and is one of the most versatile varieties.

McIntosh:

This apple was discovered by a John McIntosh, a farmer in Ontario in the early 19th century. This is brilliant green variety of apple that is sweet with just a trace of tartness. It is a favorite in lunchbox and excellent for snacks, sauces. It does come across as a baking or freezing apple though it is one of the most preferred choices for making pies and for salads.

Famous products of apple:

Apple candy:

Candy is a sugar based confectionery, made from concentrated sugar solution, to which they generally add the apple flavour, to produce yummy, mouth watering apple candies, which melts slowly in the mouth, with a rich taste of apple. It is a rich source of energy.

Apple jam:

It has the fresh flavour of ordinary apples. Apple jams are usually made from the pulp and juice of the fruit. Jam contains both fruit juice and pieces of the fruit. It has a soft and even consistency with good fruit flavour, bright colour and a semi jellied texture, that is easy to spread over, but has no free liquid. Apple Jam related alternative medicine supplements and vitamins. Enhancing Immune Function and

Promoting Well-Being and are non-FDA reviewed or approved, natural alternatives, to use for high cholesterol and heart disease.

Apple jelly:

Apple jelly is a semi solid food made from fruit juice, sugar and pectin. It is a clear or translucent fruit spread, made from sweetened fruit juice and set using naturally occurring pectin present in the fruit or by adding pectin if it is inadequate. Flavouring and colouring is also added in order to enhance the quality and acceptability of the product. Apple jellies are manufactured using the clarified concentrate of the fruit. They have an excellent rich apple flavour which is soft and smooth which just slides from your mouth into the tract silkily.

Apple juice:

Apple juice is one of the fruit juices which is manufactured by maceration and pressing of apples. The expelled juice is further processed by centrifugal and enzymatic clarification to remove the pectin and starch. Apple juice nutrition supports lung health and provides rich sources of dietary fibre, vitamin A as well as vitamin C.

Apple pulp:

Apple pulp is manufactured by picking fresh fruits, which are clean, sound and properly matured. It is used in making of cookies, cakes, muffins and other such bakery products. Apples also have anti-oxidant properties. Raw apple pulp or apple juice can be applied on the skin daily.

Apple sauce:

Apple sauce is a purée made of apples. It is an inexpensive and readily available food. Apple sauce contains fibre and vitamin C. Applesauce naturally contains no fat and few calories.

Apple butter:

Apple butter is a highly concentrated form of apple sauce, produced by long, slow cooking of apples. It can be used as a fat substitute in reduced fat or fat-free cooking. The copper in apple butter helps body properly metabolize iron, and it plays a critical role in the function of nervous and immune systems.

Apple pectin:

Pectin is a type of fibre that is found in all plant cell walls and tissues. Apples contain a particularly high amount of pectin. Pectin's primary use is as a treatment for digestive disorders. It is high in fibre and can be used to regulate bowel movements. Pectin is also an antioxidant. Antioxidant foods appear to confer a number of health benefits, including lowering cholesterol, helping people manage diabetes and potentially reducing the risks of certain cancers.

Health benefits of apple:

Apples boost gum health:

Apples have long been called nature's toothbrush. Though eating an apple doesn't actually cleanse the teeth, biting and chewing one stimulates the gums and the sweetness of the apple prompts an increased flow of saliva, which reduces tooth decay by lowering the level of bacteria in the mouth.

Boosts immunity:

Apples have an antioxidant known as quercetin which is especially found in red delicious apples. This antioxidant boosts immune system to build the natural defenses of the body. Red apples contain an antioxidant called quercetin. Recent studies have found that quercetin can help boost and fortify your immune system, especially when you're stressed out (Jeanelle and Rui, 2004).

Weight loss:

Apples satisfy hunger for few calories so it's not surprising that they can be part of a healthy diet that promotes weight loss. Apple and pear intake has also been associated with weight loss in middle aged overweight women in Brazil (Moura, 2003).

Beat diarrhea and constipation:

Even though diarrhoea and constipation are two very different stomach ailments, apples can help counter both. The fibre present in apples can pull water out of your colon in case of constipation and absorb excess water in case of diarrhea.

Improve memory:

Eating an apple everyday can prevent the decline of a neurotransmitter known as acetylcholine thus improving your memory. A study also found that this property of an apple, can slow the mental decline found in people with Alzheimer's. In humans, higher intake of vegetables and fruit, such as apples, has been shown to reduce the risk of degenerate conditions such as Alzheimer's (Dai *et al.*, 2006).

Glowing skin:

One of the lesser known benefits of eating an apple is that it's great for the skin. It is rich in Vitamin C and antioxidants which prevent signs of ageing, wrinkles and keeps skin glowing.

Anti cholesterol:

Apples have high amounts of fibre. When we eat apples, the soluble fibres compete with fats in the intestine. This competition between fibre and fats result in the decrease of absorption of LDL low-density lipoprotein or bad cholesterol levels and increase in absorption of HDL high density lipoprotein or good cholesterol. Aprikian *et al.* (2003) found

that combined apple pectin and apple phenolic fractions lowered plasma and liver cholesterol, triglycerides and apparent cholesterol absorption to a much greater extent than either apple pectin alone or apple phenolic alone.

Asthma:

Phyto-chemicals and polyphenols are the chemicals that give apple its healing properties which can assist an individual recovering from asthma, breathing problems and improve the general functioning of the lungs. Willers *et al.* (2007) reports that children of mothers who eat apples during pregnancy are much less likely to exhibit symptoms of asthma, including wheezing.

Diabetes:

Apples are loaded with soluble fibres, the key to blunting blood sugar swings. The high soluble fibre, pectin in apples, helps in controlling blood sugar levels in the body by transporting the sugar into the blood stream at a slower rate. Women who eat at least one apple a day are 28 per cent less likely to develop type 2 diabetes than those who don't eat apples. Those consuming fruit also had a significantly lower blood glucose level when compared to those consuming the oat cookies (Moura, 2003).

Anti cancer:

Apples have potent anti-cancer abilities that protect the body from the life-sucking cancerous cells. This is the most important apple fruit benefit of all. In a finnish study involving 10,000 men and women and a 24-year follow-up, a strong inverse association was seen between flavonoid intake and lung cancer development (Knekt *et al.*, 1997).

Conclusion:

Apple is king of delicious fruit" due to its beautiful shape, attractive colour and very good taste. It also contains

phytochemicals and flavoid. It has different varieties and its play a role for making many products. Eating whole apples can satisfy hunger and can, therefore, be excellent for controlling weight. Eating apples can reduce tooth decay biting and chewing an apple stimulates the production of saliva which lowers the levels of bacteria in the mouth. Apple has rich in fibre, which helps prevent absorption of dietary-LDL or bad cholesterol in the gut. Apple skin contains pectin which lowers the body's need for insulin and help in the management of diabetes.

LITERATURE CITED

- Aprikian, O., Duclos, V., Guyot, S., Besson, C., Manach, C., Bernalier, A., Morand, C., Rémésy, C. and Demigné, C. (2003). Apple pectin and a polyphenol-rich apple concentrate are more effective together than separately on cecal fermentations and plasma lipids in rats. *J. Nutr.*, **133** (6) : 1860–1865.
- Dai, Q., Borenstein, A.R., Wu, Y., Jackson, J.C. and Larson, E.B. (2006). Fruit and vegetable juices and alzheimer's disease: The *Kame* Project, *American J. Medi.*, **119**(9): 751- 759.
- Jeanelle, Boyer and Rui, Hai Liu (2004). Apple phytochemicals and their health benefits. *Nutr. J.*, **3**:1- 15.
- Knekt, P., JaYvinen R., SeppSnen, R., Helibvaara, M., Teppo, L., Pukkala, E. and Aromaa, A. (1997). Dietary flavonoids and the risk of lung cancer and other malignant neoplasms. *American J. Epidemiol.*, **148**(3): 223–230.
- Moura Anibal Sanchez (2003). Weight loss associated with a daily intake of three apples or three pears among overweight women. *Nutrition*, **19** (3) : 253–256.
- USDA (2012). *No citrus fruits and nuts*: Preliminary Summary. Cited from Error! Hyperlink reference not valid. dated on 20/01/2014.
- Willers, S.M., Devereux, G., Craig, L.C.A., McNeill, G., Wijga, A.H., Abou, El-Magd, W., Turner, S.W. and Helms, P.J. (2007). Maternal food consumption during pregnancy and asthma, respiratory and atopic symptoms in 5-year-old children. *Thorax.*, **62** (9) : 773-779.

Received : 22.01.2014; Accepted : 24.05.2014