



PASTA

is a type of food made from a dough using flour, water and/or eggs. The dough is shaped and can be stored. Pasta is boiled prior to consumption. There are many variations of shapes and ingredients that are all called pasta. A few examples include spaghetti (solid cylinders), macaroni (tubes or hollow cylinders), fusilli (swirls), and lasagna (sheets).

Pasta can also denote dishes in which pasta products are the primary ingredient, served with sauce or seasonings. The word comes from Italian *pasta* which shares its origins with "paste", meaning "dough", "pasta", or

"pastry" as in "small cake". As recently as 1918 the English word "paste" was used instead of or alongside the Italian *pasta*.

History

Making pasta; illustration from an edition of *Tacuinum Sanitatis*, Europe, 15th century.

Though the Chinese were eating noodles as long ago as 2000 BC (this is known thanks to the discovery of a well-preserved bowl of noodles over 4000 years old), the familiar legend of Marco Polo importing pasta from China is just that—a legend, whose origins lie not in Polo's *Travels*, but in the newsletter of the National Macaroni Manufacturers Association. The works of the 2nd century CE Greek physician Galen mention *itrion*, homogenous compounds made up of flour and water. The Jerusalem Talmud records that *itrium*, a kind of boiled dough, was common in Palestine from the 3rd to 5th centuries AD. A dictionary compiled by the 9th century Syrian physician and lexicographer Ishaq bar Ali defines *AD s itriyya* as stringlike pasta shapes made of semolina and dried before cooking, a recognizable ancestor of modern-day dried pasta.

One form of *itrion* with a long history is *laganum* (plural *lagana*), which in Latin refers to a thin sheet of dough. In the 1st century BC work of Horace, *lagana* were fine sheets of dough which were fried and were an everyday food. Writing in the 2nd century Athenaeus of Naucratis provides a recipe for *lagana* which he attributes to the 1st century Chrysippus of Tyana: very fine sheets of a dough made of wheat flour and the juice of crushed lettuce, then flavored with spices and deep-fried in oil.^[6] An early 5th century cookbook describes a dish called *lagana* that consisted of several layers of rolled-out dough alternating with meat stuffing and baked in an oven, a recognizable ancestor of modern-day *Lasagna*.

Some have attributed the innovation of dried pasta, in the form of long thin noodles we use today (spaghetti) to the Arabs who populated Southern Italy (i.e. Sicily) around the 12th Century. Prior to this, Italians are said to have eaten their pasta freshly made (*pasta fresca*) in a gnocchi like form.

Ingredients

There are many ingredients that can be used to make pasta dough. They range from a simple flour and water mixture, to those that call for the addition of eggs, spices and cheeses to the dough.

Under Italian law, dry pasta can only be made from durum wheat semolina flour. This flour has a yellow tinge in color. Italian pasta is traditionally cooked *al dente* (Italian: "to the teeth", meaning not too soft). Abroad, dry pasta is frequently made from other types of flour (such as farina), but this yields a softer product, which cannot be cooked *al dente*.

Particular varieties of pasta may also use other grains and/or milling methods to make the flour. Some pasta varieties, such as Pizzoccheri, are made from buckwheat flour. Various types of fresh pasta include eggs (*pasta all'uovo*). Gnocchi are often listed among pasta dishes, although they are quite different in ingredients (mainly milled potatoes).

From Harvest to Manufacture



A great deal of attention and care is taken in the behind the scene activities of pasta before it is served on a lavish dinner table. The journey begins from selection of best quality of wheat harvest and segregating them according to their chemical constituents and physical features. The mills are the next destination of the wheat where they are separated from the chaff and grinded to produce flour. From the milled flour, the durum wheat is the sole and basic ingredient for production of pasta whereas the common wheat is used to produce bakery and the confectionery goods.

The next stage involves the tedious process of mixing water with durum wheat flour. This kneading requires lot of expertise because during the process, the starch and the

protein components mix evenly with water to produce gluten. Gluten is basically a protein net that brings together the starch-hydrated granules. The gluten brings the feature of elasticity to the dough. As a result of this procedure the mixture takes a unique appearance, different from a typical ball of dough. This homogeneous and stretchable dough is made possible only from the use of durum wheat flour and water. The Italians religiously maintain the authenticity of the production procedure and never dilute it with use of salt, preservatives or colouring. The smooth pasta dough then remains at the disposal of the creativity of the traditional pasta makers. The masters of Italian kitchen draw out different outlines of the pasta by spreading it out on drawplates or dies. To increase the longevity and preservative quality of the shaped out dough pieces, they are sent to a drying room. Here the extra water content of the product, nearly 30% of its weight, is extracted out.

The extrusion process requires different time management for different kinds of pasta product. This diligent effort involves fanning out the additional humidity through blowing of warm air. It is important to maintain the final humidity level precisely that is not more than 12.5%. Finally, the products are passed on to a cooler to bring them back to room temperature. The final stage involves packaging the conditioned and designed dough pieces in cardboard boxes or in transparent bags. Special care is taken during this phase so that the nutritional value of the product remains intact without any chance of external contamination. A label or statement informing the ingredients and other necessary details about the pasta is attached to the packets.



Types of pasta



Durum wheat flour pasta: Traditional pasta makers of Italy swear by durum wheat when it comes to pure pasta. No matter what your choice maybe, simple or flavoured, with or without egg, this natural element is the must ingredient. In fact, durum wheat is the only type of grinded cereal that can hold on the tightness of pasta, in contrast to the common wheat ones that go soggy. The Italians follow a precise and measured method of development and production of pasta that involves drawing, rolling and subsequent drying of the dough under temperate conditions. This makes Italian pasta stand out in the global crowd.

Special pasta: Pasta production is a delicate business and if deters from its regular path of simple mixture of durum wheat and water, it requires special mention. Pasta made out of flours that contain other permitted ingredients such as vegetables, greens (tomato, spinach), malt or gluten, various fillings (vegetables, meats, cheeses, eggs, fish, mushrooms) fall under the special category.

These are usually referred to as the “durum wheat flour pasta” and the label above packaging usually mentions names of all the added ingredients.

Egg pasta: The egg pasta is a smooth mixture of flour and at least 4 whole chicken eggs. The de-shelled eggs are kneaded well to create dough weighing in all not less than 200 grams for every Kg of flour.

Diet pasta: The diet pasta is no different from the regular ones available in the market except for the additional nutritional quality. While preparing, the mixture is enriched with content of glucide, protein, calories or sodium. Normally, these are specially designed for people suffering from diabetics, heart disease or people who are allergic to gluten.

Fresh pasta: The fresh pastas are the types that reign the world of Italian cuisine. It is basically egg pasta with which tagliatelle, quadrucci, maltagliati and filled pasta like lasagne, cannelloni, tortellini and ravioli are made.

Another special feature of fresh pasta is that it usually have more humid factor of 30% instead of the regular 12.5%. It is made from common wheat flour and other ingredients like vegetables and various fillings. Fresh eggs are also used.

Wholemeal pasta: The wholemeal pasta is the most fibre-enriched of all times. It is prepared with wheat bran and fibre to guarantee a higher fibre content. The calculation brings the fact that each 100 grams of wholemeal pasta contain 6 grams of fibre. This accounts for about 20% of the daily amount recommended by nutritionists

Quality of pasta



The qualitative factors of Pasta can be briefly summarised in 5 points:

- The type of place of origin of the durum wheat from which the flour is produced.
- The characteristics of the flour.
- The manufacturing processes of kneading, drawing and drying.
- Possible added ingredients.
- The hygiene of preservation.

Italy, the originator of pasta, is very strict about its production procedure and follows stringent methods. The law n. 580 of 04/07/67 clearly states that and use of common wheat flour in place of durum wheat flour in pasta is a fraudulent act. So, manufacturing of pasta, especially dry pasta, with common wheat

is considered to be against law. The standard measure for pasta mixture is flour with 30% water. To maintain the protein structure and tightness of the dough, the flour must contain particles of uniform dimensions. While too small particles will make the dough soggy, the bigger ones will absorb too much water that disturbs the homogeneity of the dough.

When raw, good quality dry pasta must have the following characteristics:

- it must have a uniformly smooth appearance and texture;
- no spots or dark shades must be visible when light shines through it;
- it must have a clear and unmistakable amber yellow colour;
- it must be odourless;
- it must taste slightly sweet;
- when broken it must make a dry sound and the fracture must appear smooth and glassy with no air bubbles.

After the balanced proportion of water and flour, then the two major components of pasta, starch and gluten comes. They play a big role in maintaining the proportion and consistency of the mixture. Starch and gluten comes to play during cooking, as the pasta takes a particular shape and texture depending on them.

Starch defines the component of carbohydrate found at 60-70% in the wheat grain. In raw pasta, starch is found in the granules. On the other hand, the gluten is a viscous substance resembling the Latin gluten = glue. These are not really wheat-based components but it is formed through the interaction of two proteins, gliadin and glutelin when these are hydrated. These appear in dough of pasta when water is added to the flour and kneaded thoroughly. This gluten blend with granules of starch and form a consistent and regular arrangement. While cooking, these two ingredients play completely different roles. The starch granule absorbs water and rapidly swells up until it breaks and frees its content in the water; the two gluten proteins on the other hand coagulate forming a very compact lattice that envelopes the starch granules and tries to hold them as much as it can.

These two contrasting transforming behaviours take place under same temperature. While the starch tends to absorb water, swelling till it breaks, the protein grid that, coagulating, tries to stop the complete dispersion of the starch. In poorly prepared pasta, the starch out balances the protein element and the pasta turns out to be a rigid piece of wheat with whitish water. A pasta that is prepared with well balance of the elements is a soft and spongy one as the gluten has managed to stop the starch from absorbing water. Thus the internal balance, nutritional value and taste of pasta are preserved.

Nutritional values

Pasta is an all rounder in the world of gourmet. It fairs as a comfort food, snack and a nutritious element, all at one go. Pasta is a good option for those who count their diet in every bite. A 100 gram of pasta delivers your system 350 Kcal, a healthy protein dose of 11%-12% and less than 1% fat. Your digestive system takes less pain to absorb pasta and this gifts you the luxury to indulge in any kind of seasoning or garnishing before having a bite of your favourite pasta. Moreover pasta is like a nullified substance with little existence of vitamins and mineral salts, except potassium. Naturally, the cook can determine the nutritional value of a particular kind of pasta by adding his or her required amount of meat, fish, legumes, vegetables and various sauces. In a way we can say that pasta is a food that we can customise according to our taste bud and health requirement, a unique dietary attribute indeed.

Brief composition of durum wheat pasta:

WATER: 12.5%

PROTEINS: 11.5%

FATS: 1.2%

CARBOHYDRATES: 74%

Pasta can also be regarded as the best companion for a person on diet control as its fat content is just 0.3%. Contrary to popular belief, pasta doesn't tilt your body mass to higher side but contributes only 350 calories for every 100 grams. This statistics comprise of only 14% of the daily nutritional need and falls short of any heavy food quality, taking into account that 2,400 calories a day is the average need of a healthy adult. With such taste and flavour and dietary values, pasta tops in the food lovers' and dieticians' chart as well.

Nutritional values for 100 grams of wheat flour pasta

Energy Kcal 353.00 KJoule 1476.00 Calories from protein 12.00% Calories from carbohydrates 84.00% Calories from fats 4.00%	Vitamins Thiamine (B1) 0.10 mg Riboflavin (B2) 0.20 mg Niacin (B3) 2.50 mg Fat acids Total saturated fats 0.22 g - C16:0 (palmitic) 0.20 g - C18:0 (stearic) 0.01 g - C20:0 (peanut) 0.01 g Total monounsaturated fats 0.16 g - C18:1 (oleic) 0.16 g Total polyunsaturated fats 0.69 g - C18:2 W6 (linoleic) 0.64 g - C18:3 W3 (linolenic) 0.05 g	Quantity 0.10 mg 0.20 mg 2.50 mg Quantity 0.22 g 0.20 g 0.01 g 0.01 g 0.16 g 0.16 g 0.69 g 0.64 g 0.05 g	Minerals Calcium 22.00 mg Iron 1.40 mg Phosphorus 189.00 mg Magnesium 51.00 mg Potassium 192.00 mg Copper 0.32 mg Selenium 2.70 mg Zinc 1.15 mg	Quantity 22.00 mg 1.40 mg 189.00 mg 51.00 mg 192.00 mg 0.32 mg 2.70 mg 1.15 mg
Chemical composition Edible part 100.00% Water 10.80 g Protein 10.90 g Carbohydrates 79.10 g Of which - Soluble sugars 4.20 g - Starch 68.10 g Fats 1.40 g Of which - Saturated 0.22 g - Monounsaturated 0.16 g - Polyunsaturated 0.69 g Total fibre 2.70 g Of which - Soluble fibre 1.15 g - Insoluble fibre 1.55 g Phytic Acid 0.25 mg	Quantity 100.00% 10.80 g 10.90 g 79.10 g 4.20 g 68.10 g 1.40 g 0.22 g 0.16 g 0.69 g 2.70 g 1.15 g 1.55 g 0.25 mg	Amino acids Lysine 219.00 mg Histidine 226.00 mg Arginine 395.00 mg Aspartic acid 509.00 mg Threonine 314.00 mg Serine 568.00 mg Glutamic acid 3512.00 mg Proline 1189.00 mg Glycine 354.00 mg Alanine 359.00 mg Cystine 255.00 mg Valine 544.00 mg Methionine 183.00 mg Isoleucine 455.00 mg Leucine 834.00 mg Thyrosine 310.00 mg Phenylalanine 542.00 mg Tryptophan 105.00 mg	100g of edible part 219.00 mg 226.00 mg 395.00 mg 509.00 mg 314.00 mg 568.00 mg 3512.00 mg 1189.00 mg 354.00 mg 359.00 mg 255.00 mg 544.00 mg 183.00 mg 455.00 mg 834.00 mg 310.00 mg 542.00 mg 105.00 mg	100g of protein 2.01 g 226.00 g 3.62 g 4.67 g 2.88 g 5.21 g 32.22 g 10.91 g 3.25 g 3.29 g 2.34 g 4.99 g 1.68 g 4.17 g 7.65 g 2.84 g 4.97 g 0.96 g



Preparation

Pasta can be made by hand but is more commonly made with special tools or machines. Extrusion tools force ingredients through holes in a plate known as a die. Lamination tools squeeze ingredients through rollers into sheets of a particular thickness, which are then cut by slitters.

Accompaniments

Common pasta sauces in Northern Italy include pesto and ragù alla bolognese; in Central Italy, simple tomato sauce, amatriciana and carbonara, and in Southern Italy, spicy tomato, garlic, and olive oil based sauces, often paired with fresh vegetables or seafood. Varieties include puttanesca, *spaghetti alla norma* (tomatoes and eggplant), *pasta con le sarde* (fresh sardines, pine nuts, fennel and olive oil).

Fettuccine Alfredo, with cheese and butter, and spaghetti with tomato sauce with or without ground meat or meatballs are popular Italian-style dishes in the United States.

As pasta is introduced elsewhere in the world, it has been incorporated into a number of local cuisines that may have significantly different ways of preparations from those of its country of origin. In Hong Kong, the local Chinese has adopted pasta, primarily spaghetti and macaroni, as an ingredient in the Hong Kong-style Western cuisine. In the territory's Cha chaan tengs, pasta is cooked in water, and served in broth with ham or frankfurter sausages, peas, black mushrooms, and optionally eggs reminiscent of noodle soup dishes. This is often a course for breakfast or light lunch fare. The method often involves cooking the pasta well beyond the al dente stage and washing the pasta off starches after cooking, measures frowned upon in Italy or in Hong Kong's more authentic Italian eateries.

