From Durum to Pasta

MILLING

There are fundamental differences between milling common wheat and durum wheat. While common wheat is milled to produce flour, the objective of milling durum wheat is to produce semolina and minimize the production of durum flour. Semolina is the coarse, granular particles of endosperm used for pasta processing.

Durum Wheat
Canada is a supplier of high quality amber durum wheat. Canada Western Amber Durum (CWAD) produces a high yield of semolina, with excellent pasta properties.

Wheat Intake
Incoming wheat is weighed, sampled and analyzed, passed through a preliminary cleaner and magnet, then stored according to grade.

Cleaning
Meticulous cleaning is required for durum wheat. Chaffs, unpopped seeds, dirt and other extraneous material through machines which separate by size (sieves), specific gravity (density and gravity table) and shape (indentured cylinder). Fractional cleaning equipment (occlusors) scour the surface of the kernel, removing the outermost layers of the bran.

Tempering
During tempering, water is added to toughen the outer bran coat and improve separation from the endosperm. Tempering also mellows the endosperm for grinding. Traditionally, durum wheat is tempered for a relatively short time. However, new technology in pasta manufacturing now enables finer semolina to be used, allowing for longer tempering periods.

The Milling Process
Milling is essentially a process of grinding and separating. Grinding is done on break rolls, sizing rolls and reduction rolls. Separation is done using machines called sifters and purifiers.

A durum mill has an extended break system in which grinding is relatively gradual. The endosperm is released in coarse granular form rather than as flour. The grading, purifying and sizing systems are more extensive in a durum mill, but the reduction system is very small compared to that of a flour mill.

Semolina
Semolina, the main product of durum milling, is coarser than the flour produced in common wheat milling. Desirable characteristic for semolina include good color, minimum dark or bran specks and uniform granulation. Small amounts of fine semolina and flour are produced. These are often combined with semolina to produce blended material which can be used for a wide range of long and short pasta goods.

Amber Durum Wheat Kernel
The kernel of amber durum wheat is a storehouse of nutrients that requires careful processing to separate them into their component parts.

Semolina is made from the endosperm which makes up about 83 per cent of the wheat kernel and is composed of starch and protein.

Durum wheat is different from most common wheats. Its kernels are larger and longer and the endosperm is especially hard and yellow in color.

Amber Durum Wheat Kernel Cross-section
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PASTA MAKING

A quality pasta product begins with high quality raw material. Durum wheat is ideally suited for pasta because of its unique color, flavor and cooking qualities. Durum is also used to produce couscous and durum hearth breads.

Mixing
Semolina is mixed with water to form a lumpy dough. The dough is not fully developed until it passes from the mixing chamber into the extruder.

Extrusion
Dough is forced through various shaped dies, under very high pressures, to produce a wide range of different shapes of pasta products. The extrusion chamber is designed to draw off heat generated by the pressure and friction created during the extrusion process. To prevent the pasta from sticking together in the drying process, long pasta is subject to a blist of air immediately after extrusion. Short pasta is transferred to a shaking paddle to ensure it is separated.

Drying
Drying is a crucial part of the process for production of high quality pasta products. Humidity, air flow and temperature are carefully controlled as the pasta passes through several dryers. Modern high temperature drying systems improve pasta color and cooking quality. In the final stage of drying, cooling chambers return the dried pasta to normal atmospheric conditions. In general, the product is dried to a moisture level of about 12 per cent. The total drying time can take from six to 24 hours depending on the drying technology used.

Packaging
Following drying, the pasta is cooled, stored, cut and then packaged.

Couscous
Couscous is prepared from steamed durum semolina and is usually served with spices, vegetables and meat. A staple in most parts of North Africa, couscous is a high quality durum semolina.
Canadian durum is the product of a combination of plant breeding to meet market needs, careful varietal testing and registration, world-class management by farmers, and adherence to the strict quality standards required by millers, pasta processors and other end-users.