



## DE CECCO DURUM WHEAT SEMOLINA PASTA

### SLOW DRYING FOR HIGH-QUALITY PASTA

#### What makes high-quality pasta?

While the legal name in Italy is simply “durum wheat semolina pasta”, in France this pasta is called “Pâtes alimentaires de semoule de blé dur de qualité supérieure” (“Superior-quality durum wheat semolina pasta”): there is no legal definition in Italy of “high quality”. We therefore feel it is necessary to clarify what is meant by “high-quality pasta”.

The most recent and comprehensive definition of high-quality pasta (Premium) was proposed by researchers at Rome’s Sapienza University. (2017): “**... to create a pasta that achieves high-quality standards, it requires all of the following: good texture and cooking properties; an even yellow colour; a flavour similar to that of mature wheat; a loss of essential amino acids; a minimal formation of compounds with antinutritional effects**”.

In other words, a high-quality pasta must have the correct texture, an excellent firmness during cooking, and be slow-dried to avoid damage caused by high temperatures. These are the exact properties that De Cecco pasta possesses, and that make it an exemplary model of high-quality pasta products.

Pasta, by tradition and ever since it first became a food produced with man-made systems (as opposed to natural methods, since sun-drying is now considered unacceptable by hygiene standards) has always been dried for considerable lengths of time. Furthermore, according to the 1889 Treccani encyclopaedia, the founder of De Cecco was one of the first inventors of a truly hygienic pasta-drying system that was no longer at the mercy of the climatic conditions of the production area. At the end of the 1960s, it was discovered that it was possible to accelerate (reduce) drying times considerably, by raising the temperature during drying; so much so, that a few years later between 1980 and 1990, pasta could be dried in just a few hours by using temperatures of 80-90°C. These systems quickly became popular, for the economic benefits enjoyed by producers, but also resulted in a decrease in quality and in the nutritional properties of the pasta itself.

De Cecco, a family-run company with years of experience and foresight, has always been faithful to traditional pasta methods, believing it vital to dry pasta slowly. This decision has influenced the work process, the De Cecco method, which involves the entire supply chain - from the search and selection of grain for the De Cecco mill, to the pasta-making, for excellent quality standards.

The long drying times at De Cecco also mean low-temperature drying, a feature that nowadays is almost solely found among small-scale producers (Giannetti 2013), with the difference that our pasta has a characteristic that everyone recognises – an excellent cooking quality.

#### Negative effects of high-temperature drying

The negative effects take two main forms:

- the formation of substances not naturally occurring in semolina (AGEs)
- the formation of substances not naturally occurring in the raw ingredient, with a bitter and astringent taste and significant colour/fragrance alterations of the semolina.

These effects can be placed under the umbrella term “heat damage”. Numerous studies have been dedicated to the issue since 1970. More recently, published papers (2013-2017, see Giannetti, Marti, Tecnica Molitoria etc.) have highlighted how assorted pasta products exhibit heat damage (identified with the analysis of furosine, the marker that assesses the intensity of heat damage) of higher than 300mg per 100g of protein.

Other recent studies on wholegrain pasta (2017, in Italian and international journals) confirm, in the majority of wholegrain pasta samples analysed, values of furosine greater than 500-600mg per 100g of protein, indicating high-temperature drying processes.

Among the wholegrain pasta samples analysed in the aforementioned studies, only De Cecco revealed low values (typical of slow-dried pasta), with levels of furosine noted between 200 and 250mg per 100g of protein.

In the last few years, our company’s decision to continually improve the quality of our products has brought about even more noteworthy results than those reported in the literature. In fact, today, De Cecco’s durum wheat semolina pasta has average levels of furosine between 50 and 200 mg per 100g of protein, proof that quality depends not on the size of a company, but on its strategy and goals.

### **The qualitative benefits of slow drying**

De Cecco’s durum wheat semolina pasta is a rare example of slow-dried pasta at low temperatures: it does not exhibit the effects of high-temperature drying as highlighted by recent studies on market pasta samples, effects which cause a drop in quality and in its nutritional properties. With low-temperature drying, the colour, taste and scent of the pasta are very similar to those of its ingredient semolina, with the typical yellow colour, sweet taste and fragrance of semolina grain; its texture and firmness in cooking depend heavily on the grain used, which must be high quality, with firmness and elasticity. It is a slower process with longer drying times, carried out in larger production plants with resulting higher costs.

The importance of slow drying pasta at low temperatures has been highlighted also in the “ITALIAN JOURNAL OF PRACTICAL NUTRITION” no.12 of 2018, which published the abstracts of speeches given at the NutriMi Conference, the Forum of Practical Nutrition for Doctors, Nutritionists and Biologists. Prof. L. Piretta (Food Science and Human Nutrition, Campus Bio-Medico University of Rome) in the abstract entitled: “CARBOHYDRATES IN DAILY NUTRITION: a re-evaluation of the role of high-quality pasta” states that:

*“It is necessary to remember however that not all wholegrain pasta has the same nutritional value... thus, it is fundamental that the pasta be of good quality, not only in terms of the choice of raw ingredients but also in the processing stages, particularly in the drying stage, when the decision to use low temperatures and longer drying times allows for a reduction in heat damage... for a better retention of its rich nutrients”.*

### **The exceptional cooking quality of De Cecco pasta**

Our customers know and appreciate the cooking quality of our pasta, both at recommended cooking time and longer cooking time (for firmness while cooking). This is also evident from the cooking tests described in Marti’s article (T. Molitoria, 2013 page 290).

The cooking quality of the pasta can also be assessed using specific instruments; De Cecco has certified a criterion for it in its product certification, thanks to the third-party quality assessment institute DNV (see the website).

## Conclusions

De Cecco pasta is a high-quality product thanks to its excellent cooking quality (as our customers can testify every day) and, as shown by heat damage tests, it does not suffer from a drop in nutrition or quality, given it has not been subject to quick drying at high temperatures. We believe this is a crucial value that a customer must know, in order to choose wisely with a greater awareness.

How do we make a pasta with superior cooking quality and low heat damage? We use the De Cecco method – we oversee the entire supply chain, from the purchase of the wheat to the final packaging, using only high-quality grain in terms of food safety and technological quality. At the flour mill, we grind the grain gently and take only the part of the product best suited for pasta, the heart, with low extraction yields, then using the fresh semolina coarse-grain within hours of grinding. The dough is made with lots of cold water and long kneading times, followed by bronze die-drawing and slow drying at low temperatures.

## Bibliography:

- Piretta L., “**Carboidrati nell’alimentazione quotidiana: rivalutazione del ruolo di una pasta di qualità**” (*Carbohydrates in daily nutrition: a re-evaluation of the role of high-quality pasta*) Rivista di Nutrizione Pratica 32-33 2018  
[https://www.dececco.com/Rivista\\_di\\_Nutrizione\\_Pratica\\_32-33\\_2018.pdf](https://www.dececco.com/Rivista_di_Nutrizione_Pratica_32-33_2018.pdf)
- Giannetti V., Boccacci M., Mannino P., “**FLAVOUR e FUFOSINA come marker per valorizzare la tradizionale pasta di grano duro Made in Italy**”. (*Flavour and Furosine as markers for assessing the quality of traditional Italian durum wheat pasta*) Tecnica Molitoria 68: 4-17, 2017 - Rome Sapienza University - School of Economics - Management Department  
[https://www.dececco.com/TM\\_68-1\\_2018.pdf](https://www.dececco.com/TM_68-1_2018.pdf)
- Marti A, Cattaneo S, Benedetti S, Buratti S, Abbasi Parizad P, Masotti F, Iametti S, Pagani MA. “**Characterization of Whole-grain Pasta: Integrating Physical, Chemical, Molecular, and Instrumental Sensory Approaches**”. Vol.82 n° 11: 2585-2590 2017 - University of Milan, Dipartimento di Scienza per gli Alimenti, la Nutrizione e l’Ambiente (DeFENS - Department of Food, Environmental and Nutritional Sciences)  
[https://www.dececco.com/Poster\\_Convegno\\_AISTEC\\_Nov\\_2017.pdf](https://www.dececco.com/Poster_Convegno_AISTEC_Nov_2017.pdf)
- Marti A., Bottega G., Patacca C., Pagani M.A., “**Indagine sul Danno termico della pasta secca e sue relazioni con le caratteristiche della Materia Prima e delle condizioni di Processo**”. (*Investigation of heat damage on dry pasta and its relationship with the characteristics of raw materials and treatment processes*). Tecnica Molitoria 64: 286-295 2013 - University of Milan, Dipartimento di Scienza per gli Alimenti, la Nutrizione e l’Ambiente (DeFENS - Department of Food, Environmental and Nutritional Sciences)  
[https://www.dececco.com/TM\\_64-4\\_2013.pdf](https://www.dececco.com/TM_64-4_2013.pdf)
- Giannetti V., Boccacci M., Mannino P., “**FUFOSINA come MARKER di QUALITÀ della pasta di semola di grano duro**”. (*FUFOSINE as a QUALITY MARKER for durum wheat semolina pasta*) Tecnica Molitoria 68: 4-17, 2013 - Rome Sapienza University - School of Economics - Management Department  
[https://www.dececco.com/TM\\_64-12\\_2013.pdf](https://www.dececco.com/TM_64-12_2013.pdf)
- Marti A., Cattaneo S., Masotti F., Pagani M.A., “**Indagini sul DANNO TERMICO della PASTA INTEGRALE presente sul mercato italiano**”. (*Investigation into the HEAT DAMAGE to Italian market WHOLEGRAIN PASTA*). Tecnica Molitoria 67: 918-925, 2016 - University of Milan, Dipartimento di Scienza per gli Alimenti, la Nutrizione e l’Ambiente (DeFENS - Department of Food, Environmental and Nutritional Sciences)  
[https://www.dececco.com/TM\\_67-12\\_2016.pdf](https://www.dececco.com/TM_67-12_2016.pdf)