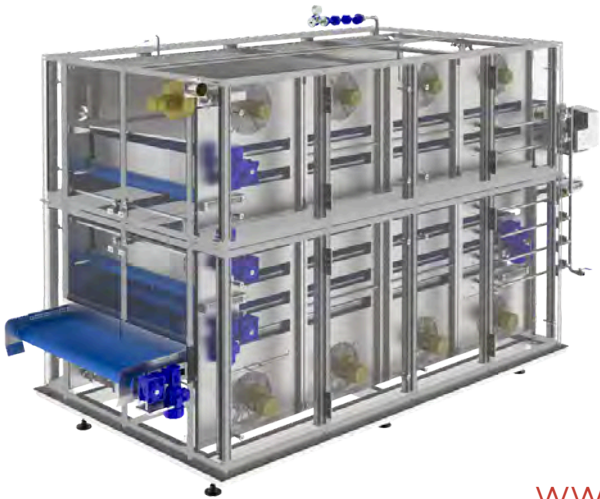




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1



Pasta in Italy and around the world: from stability to new trends

Pastaria Centre for
Economic Research



Pastaria Festival 2025: new consumption trends and signs of change in the pasta market according to NielsenIQ.

At the Pastaria Festival 2025, NielsenIQ presented a detailed update on the pasta market, with a global outlook and a focus on Italian consumption. The data offer an interesting snapshot of a sector that, while maintaining a strong position, is confronted with new dynamics and changing consumers.

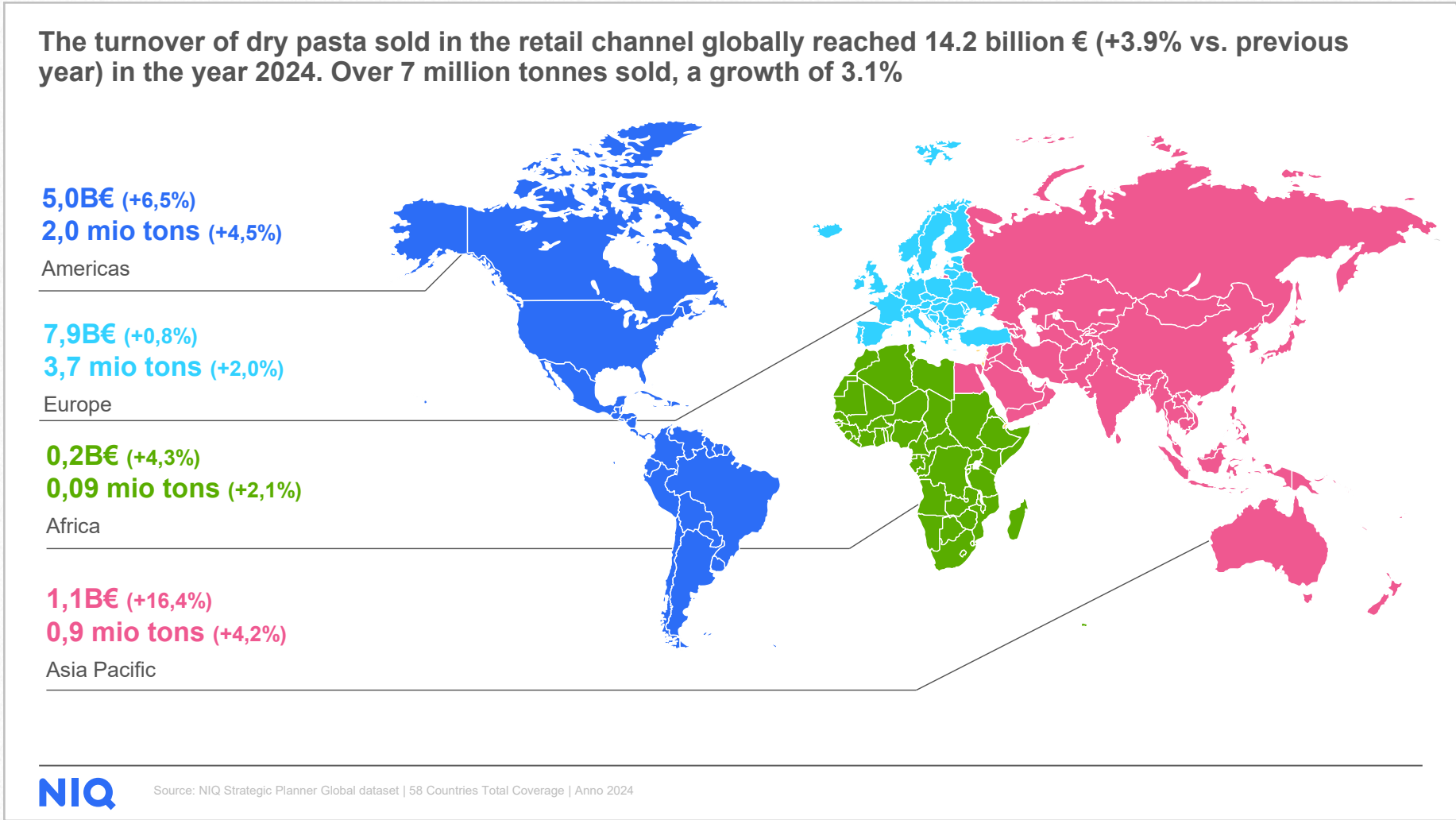
Dry pasta in the world: volumes grow but average prices fall

In 2024, the turnover of dry pasta sold in the retail channel globally reached €14.2 billion, up 3.9% compared to the previous year. Almost 7 million tonnes were sold

(+3.1%), a sign of recovery, in terms of volume, in almost all areas of the world. In particular, Asia recorded the highest growth in value (+16.4%), while Europe – although still the most important market with €7.9 billion – grew by only 0.8% in value, but 2% in volume. This dynamic suggests a downward trend in average prices linked to the easing of inflation.

Food secularisation

A profound and wide-reaching phenomenon is emerging on the Italian food scene: food secularisation. This process reflects a transformation in the behaviour and values associated with food, which is now assuming new priorities



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and shaping lifestyles. This trend has four main aspects: the pursuit of simplification and service, openness to ethnic food and new cultures, the emergence of new, often collective, indulgences, and a growing focus on well-being. These elements are also creating a new scenario as regards the Italian primo piatto (first course), in which consumers preferences and actions are tending to converge towards more flexible, personalised and mindful solutions.

Simplification and service

According to NIQ data, convenience-oriented behaviour is on the

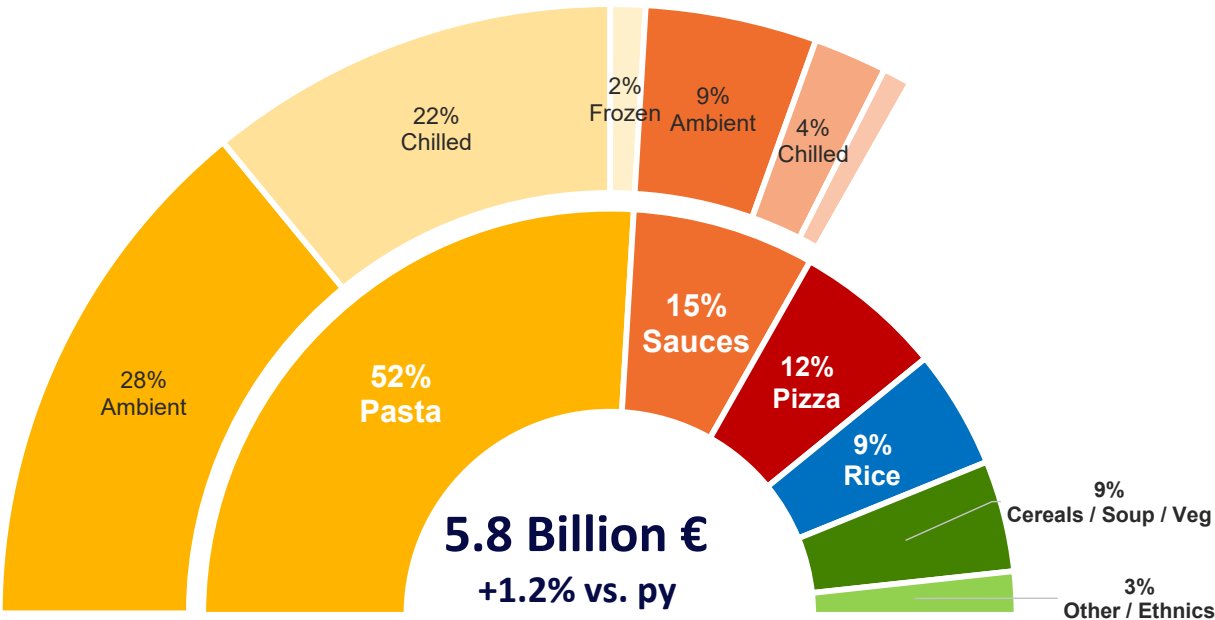
rise: average daily cooking time has dropped to 49 minutes per day – 4 minutes less than in 2020 – and the consumption of ready-made, simplified foods is increasingly widespread. At the same time, the number of people ordering home delivery of food is growing (+20% compared to 2019), while those cooking at home are increasingly seeking speedy solutions.

Ethnic curiosity and openness to new cultures

Another growing phenomenon is foreign food. 56% of Italians consume ethnic dishes, an increase of 15% compared to

Pasta – Queen of the Primo Piatto – a role to defend
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67%
of the turnover of
the
Primo Piatto
sector* consists of
Pasta with Sauce



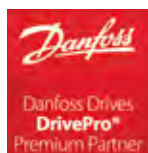
* Italy Retail Channel – Total Food including Discount



Source: NIQ Discover IT NDH RMS dataset | MAT April 2025
NIQ Consumer Panel Service



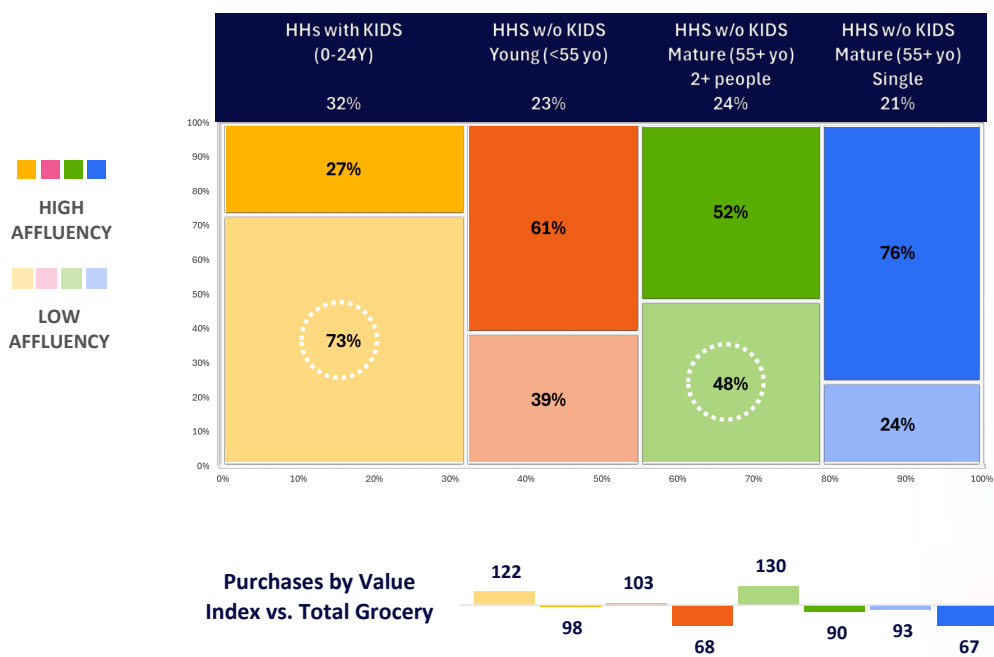
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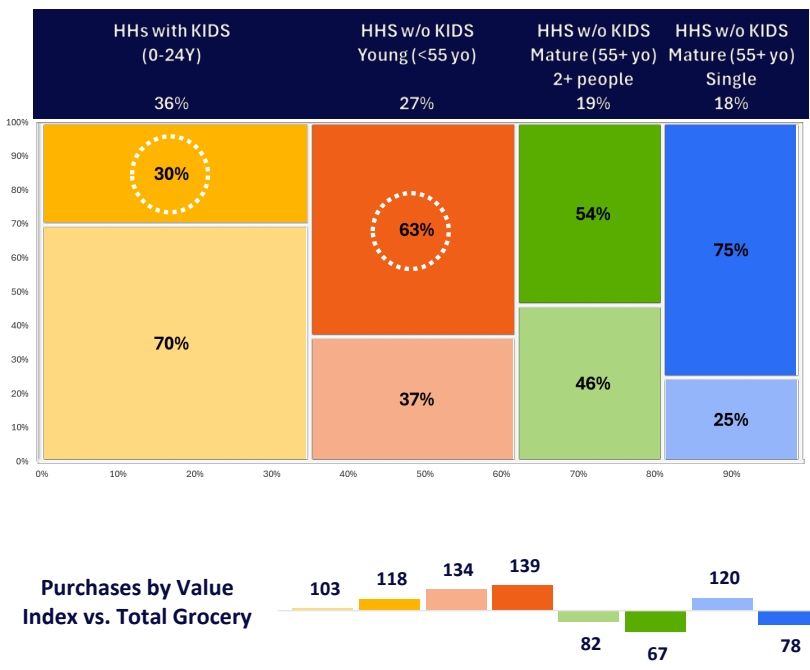
DRY PASTA SEMOLA

24 million Purchasing Households (+0.0% vs. 2023)



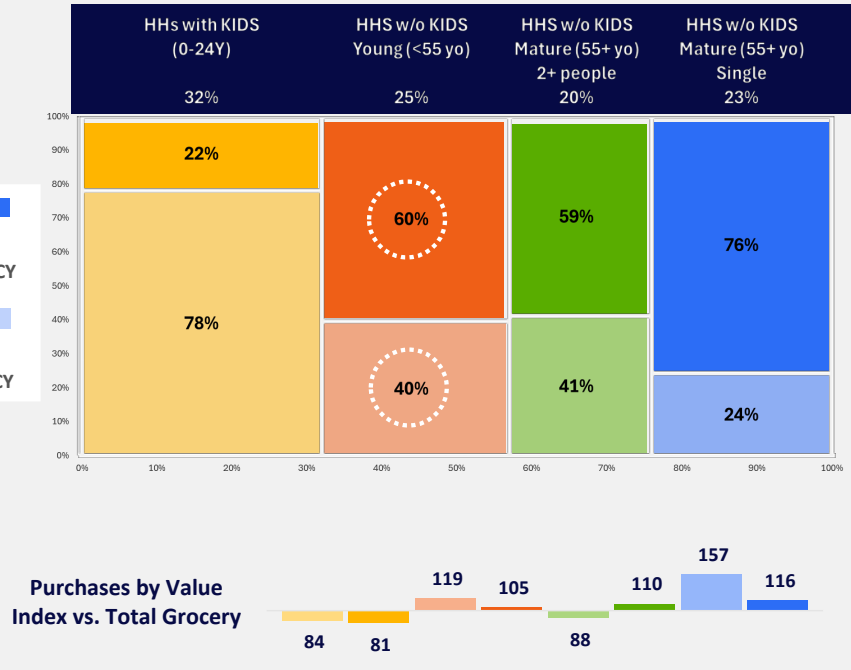
DRY PASTA GLUTEN FREE

4.8 million Purchasing Households (+21% vs. 2023)



FROZEN PASTA

5.2 million Purchasing Households (+8.5% vs. 2023)





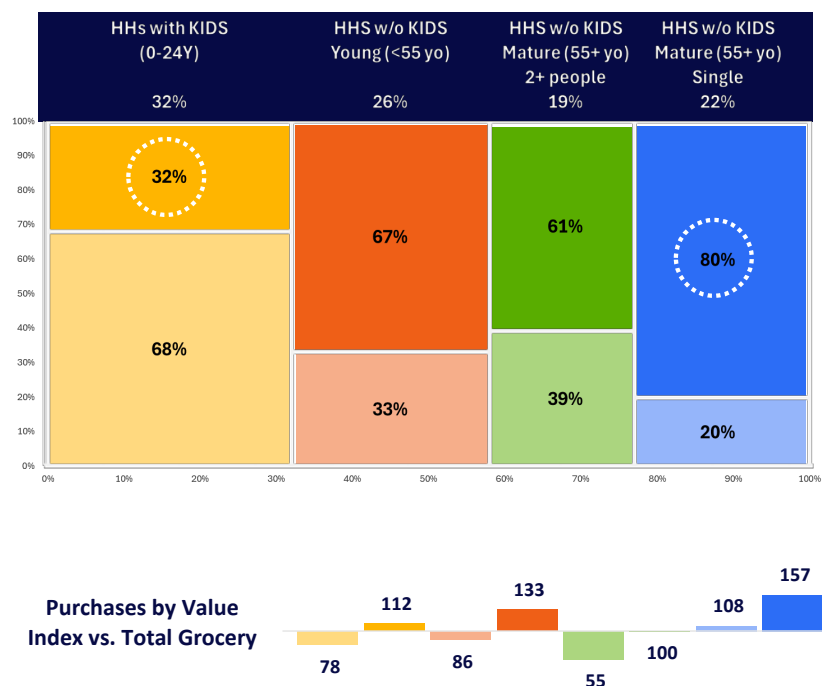
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CHILLED PASTA READY TO EAT

7.0 million Purchasing Households (+1.9% vs. 2023)

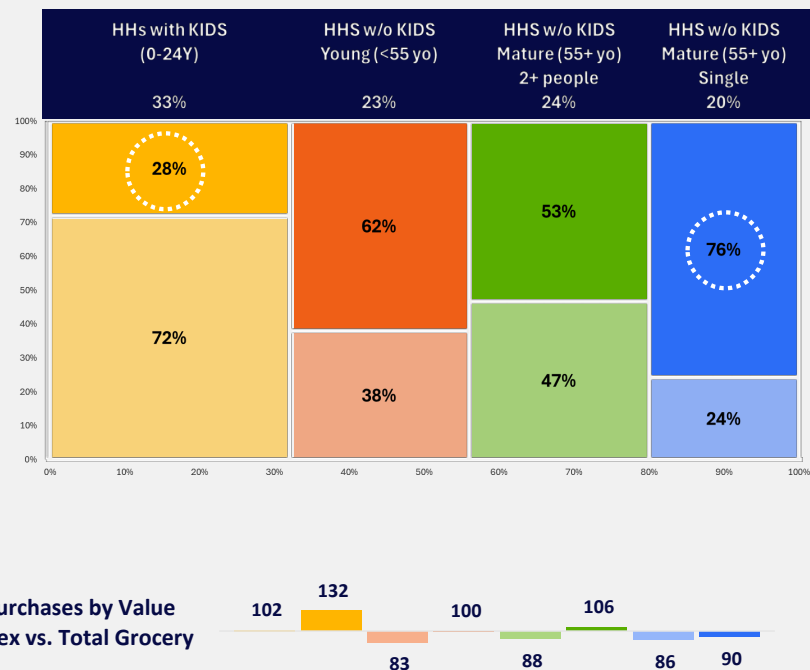


NIQ

Source: NIQ Discover IT NDH POD dataset | Anno 2024

CHILLED PASTA FILLED

20.6 million Purchasing Households (+1.3% vs. 2023)



2019. There is, therefore, a growing openness towards different food cultures, which enrich the gastronomic experience and also impact the choice of the primo piatto, with more and more international ingredients and recipes.

New indulgences and conviviality

Food has also become a social experience. Convivial occasions are on the rise: Italians who enjoy aperitifs at home have risen to 8.3 million (+2 million compared to 2019), non-alcoholic options accounting for 68% of the preference.

Although there has been a general decline in convivial occasions compared to pre-pandemic times, there is a growing demand for “meaningful” moments, where pleasure is coupled with experimentation, health and quality.

Well-being dictates the choices

Well-being is now also a key driver with regard to the primo piatto. Sales of plant-based, gluten-free or reduced-calorie foods are on the upswing. Consumers are looking for solutions that



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Pasta, while still being the signature Italian dish, can take on many different shapes and forms that respond to the desires and needs of the specific households targeted.

	HHs with KIDS (0-24Y)		HHS w/o KIDS Young (<55 yo)		HHS w/o KIDS Mature (55+ yo) 2+ people		HHS w/o KIDS Mature (55+ yo) Single	
	LOW AFFLUENCY	HIGH AFFLUENCY	LOW AFFLUENCY	HIGH AFFLUENCY	LOW AFFLUENCY	HIGH AFFLUENCY	LOW AFFLUENCY	HIGH AFFLUENCY
DRY PASTA SEMOLA	★				★			
DRY PASTA GLUTEN FREE		★		★				
CHILLED PASTA FILLED		★						★
CHILLED PASTA READY TO EAT		★						★
FROZEN PASTA			★	★				



are compatible with a healthy lifestyle, and pasta is no exception.

The primo piatto in the retail channel: A turnover of €5.8 billion

In the Italian market, pasta has held onto its central role. The total value of the primo piatto sector in the retail channel is €5.8 billion (+1.2% year-on-year), and 67% of this value is generated by pasta with ready-made sauces. The alternative categories are the ones driving growth, showing positive performance in terms of both volume and value.

Segments with a strong focus on service and well-being are expanding

The most dynamic pasta segments are those that respond to service or health needs. In particular, gluten-free pasta saw an increase of 21% in the number of purchasing households compared to 2023, totalling 4.8 million purchasing households in Italy. Frozen pasta (+8.5%, 5.2 million households) and fresh filled pasta (+1.3%, 20.6 million) also performed well. “Ready-to-eat” pasta is also on the rise (+1.9%, 7 million).

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Conclusions



Global Overview

- The turnover of dry pasta sold in modern distribution channels worldwide was **14.2 billion €** (+3.9% vs. previous year) in the year 2024
- Volume growth is generalised in almost all the top countries, often accompanied by a decrease in the average price.



Trends in the food world

- The food sector has witnessed the emergence of important trends that reflect the concept of food secularisation.
 - SIMPLIFICATION AND SERVICE
 - WELLNESS AND PLANT-BASED NUTRITION
 - ETHNICITY AND NEW CULTURES
 - CONVIVIALITY AND NEW INDULGENCES
- The first three trends in particular are having significant impacts on “primo piatto” consumption habits, as what people say actually aligns with what they do.



Pasta, Queen of the *Primo Piatto*

- The retail turnover related to the “Primo Piatto” in the retail channel amounts to € 5.8 billion (+1.2% vs. previous year), 67% of which focuses on Pasta consumed with ready-made sauces.
- The pasta category as a whole is enjoying a phase of general stability, resulting from the balance between the slowdown in dry pasta made from durum wheat semolina and the expansion of high service/wellness segments capable of attracting new households.
- The consumer profile in the high-potential target groups is multifaceted, shaped by the specific needs and desires of the various households.

NIQ

The importance of differentiation

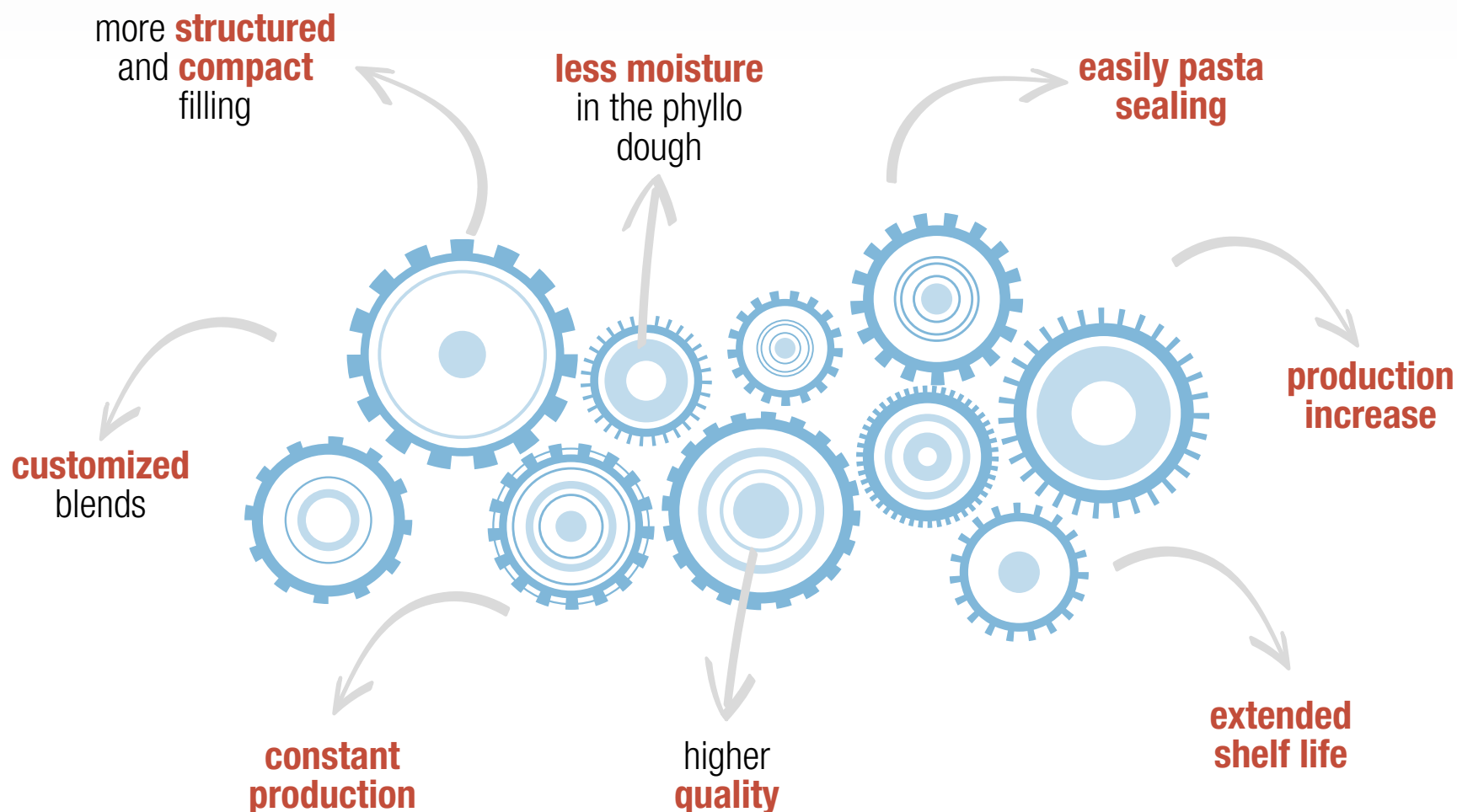
In a substantially stable market, growth depends on the ability to attract new segments of the general public. Products that offer a clear functional benefit - such as well-being, speed of preparation, or taste innovation - are performing better than traditional semolina pasta. Not to mention that semolina has reached over 24 million purchasing households (95% of Italian households), remaining stable compared to 2023.

A “Queen” in evolution

Pasta is confirmed as “Queen” of the Italian primo piatto, but it will have to diversify its offering if it is to remain at the centre of consumer choices. Emerging trends – from simplification to multiculturalism, from well-being to conviviality – are shaping a horizon that is complex but rich in opportunities. For producers, understanding new needs and transforming them into targeted products will be the key to defending and strengthening the role of pasta on the Italian table.

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2



Pastaria Festival 2025: two days of dialogue and innovation for the pasta community

Editorial team



The opening of the Pastaria Festival 2025.

From left to right: Claudio Zanão (ABIMAPI), Lorenzo Pini (Pastaria), Virna Soncin (APPAFRE), Margherita Mastromauro (Unione Italiana Food), Carl Zuanelli (IPO)

Pastaria Festival 2025, held, just this once, within the setting of Ipack-Ima in Milan, has recently come to an end. After this special edition in Milan, the event organised by our magazine will return to its natural venue: next year's appointment is in Florence, on 30 and 31 March 2026 with Fiera Pastaria & Festival.

The Pastaria Festival 2025, an annual event organised by Pastaria, held on 28 and 29 May within the setting of Ipack-Ima at Fiera Milano Rho, provided an important opportunity for the entire pasta supply chain to meet and catch up. The event was attended by industry professionals, companies, researchers and trade associations from all over Italy and abroad, who came together to reflect on the future of the sector, discuss technological solutions and debate market scenarios,

sustainability, food safety and food security.

A rich and varied programme

The Pastaria Festival 2025 programme was spread over two days, packed with a wide range of technical, economic and scientific content.

Together with Lorenzo Pini, director of Pastaria, the official opening of the proceedings on the morning of May 28 was carried out by representatives of the leading industry associations: Gherardo



Renato Dall'Agata (Fava) was a speaker at the conference *Industrial innovation in pasta: systems, research and services to support change*, organised by Fava



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The conference *Plant-based protein and pasta: new frontiers for the industry*, organised by MartinoRossi

Bonetto (APPF), Fabio Fontaneto (APPAFRE), Margherita Mastromauro (Unione Italiana Food), Claudio Zanão (ABIMAPI), and Carl Zuanelli (IPO, NPA). Their presentations concentrated on the importance of working as a system and enhancing the professional culture of pasta through events like this. The day continued with a conference promoted by GEA, the main sponsor of the Pastaria Festival, dedicated to innovative technologies for pasta production. Davide

Bertoncello illustrated the potential of the PureWave Pasteurizer system, based on microwave technology for pasteurisation, while Jürgen Spatz and Marco Ferronato presented the Thermo xChange, an efficient solution for energy recovery in dry pasta production. Following this, the focus shifted to food safety with a session by Klüber Lubrication: Federico Provenzani and Giorgio Stagni took stock of the situation and outlined the future prospects with



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In the early afternoon, Biagio Sala presented the new Anselmo line for the production of 6,000 kg/h spaghetti, a plant that combines innovation and high productivity.

The day wrapped up with a rich academic conference, sponsored by Mulmix, dedicated to new perspectives in dry pasta research. Andrea Tobaldo opened the proceedings with a speech on technological innovation for food safety in storage silos. Cristiano Laurenza, for Unione Italiana Food, discussed the topic of food “repackaging”, while Elisa De Arcangelis (Campus Bio-Medico, Rome) dealt with the development of pasta with a high dietary-nutritional value, and Mariamelia Stanzione (IPCB-CNR) closed the session with a report on new materials for food packaging.

The second day, Thursday 29 May, opened with an analysis of global trends in pasta consumption at a conference organised by the Pastaria Centre for Economic Research. Francesca Bastanzetti (NielsenIQ) and Barbara Mancini (NielsenIQ) outlined the central role of the first course in the retail channel, while Matteo Figura (Circana) provided an in-depth analysis of out-of-home pasta consumption in Italy and Europe.

Next, the conference organised by MartinoRossi explored the potential of vegetable proteins in pasta production. Stefania Perosa (MartinoRossi) opened the session with an overview of market trends, followed by Erika Martinelli (MartinoRossi), who presented technological solutions for plant-based protein supplementation. Giorgia Spigno (Catholic University of the Sacred Heart of Piacenza) analysed the nutritional benefits, while Alessia Felicetti (Pastificio Felicetti) shared the vision of a producer committed to sustainability. The programme then continued with a second academic conference, this time dedicated to fresh pasta. Coordinated by Cristina Alamprese (University of Milan), there were talks by Stefano Zardetto (Voltan Group) on the effect of storage methods on water migration in fresh pasta, Marco Dalla Rosa (University of Bologna) on the possible revision of the shelf-life concept for fresh pasta, Barbara La Gatta (University of Foggia) on an innovative process for the production of fresh pasta enriched with pomace, Valentina Giovenzana (University of Milan) on the eco-design of cauliflower gnocchi, and Luigi Cattivelli (CREA) on the genetic innovation of wheat and its possible applications for pasta.

In the afternoon, the Fava conference focused on industrial innovation, research

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and services. Renato Dall'Agata spoke about the role of research as a strategic lever, Luca Alberghini presented solutions for automatic dry pasta production lines, while Alessio Marchesani took a deep dive into technologies and automatisms for production lines making dry pasta in batches, fresh pasta and ready-meals. Alessia Lolli concluded the session with a talk on value-added services for pasta factories.

A particularly compelling moment at the Pastaria Festival was the presentation of the *Billion Meals Challenge* by Tom Quinn (Nuovo Pasta Productions, IPO). He outlined the international project aimed at providing one billion nutritious and affordable meals to those most in need, bringing the pasta industry together around a socially responsible goal.

The Pastaria Festival concluded with a closing aperitif, an informal opportunity to exchange ideas, contacts and observations at the end of two intensive days of work.

Looking towards 2026: appointment in Florence for Fiera Pastaria

The date is now set for 30 and 31 March 2026, when the Pastaria Festival will return to its natural venue within the Fiera

Pastaria in Florence, at the Stazione Leopolda. An even more specialised setting that will consolidate the identity of the event and intensify the dialogue between international players in the pasta supply chain.

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3



Effect of storage methods on water migration in fresh filled pasta

Stefano Zardetto

Quality Management, Voltan Group

Gabriella Pasini

Department of Agronomy, Food, Natural Resources, Animals and Environment (DAFNAE), University of Padua, Italy



Fresh filled pasta is a multicomponent food that undergoes changes in water content during storage. This study evaluated the effect of ambient relative humidity on water migration between pasta and filling, and outwards, under controlled temperature and packaging conditions. The results show that moisture transfer takes place in two main phases: an initial internal migration phase from the filling to the pasta and a subsequent evaporation towards the headspace, affected by external moisture. The physical contact between the two components plays a decisive role, which does not depend solely on the water activity value. Evidence suggests significant implications for product shelf-life and opens the door to potential control strategies.

Introduction

Fresh filled pasta, produced in different varieties and shapes (“tortellini”, “ravioli”, etc.) is a food typical of the Italian culinary landscape, made by combining two components, pasta and filling. The filling is the element that characterises the product and, in varying proportions, accounts for between 30% and 70% of the product’s weight. It usually consists of a mixture of minced meat or cheese and vegetables blended with some dehydrated ingredients such as bread and/or potato flakes. The product, stored at $4 \pm 2^{\circ}\text{C}$ for up to 60 days, is packaged in a protective atmosphere (CO_2 and N_2) in thermoformed trays or in flexible films with specific barrier properties to contain the gases inside the package. And according to Presidential Decree No. 187/2001, fresh pasta must maintain moisture values $\geq 24\%$ and water activity (a_w) between 0.92 and 0.97. However, the different composition of the two components (pasta and filling) can trigger internal and external water migration dynamics that can compromise product quality. Water can, in fact, migrate from the two components of the filled pasta to the headspace of the package, or vice versa, until thermodynamic equilibrium is reached during storage. Water vapour from the

external environment can enter the headspace of the package or escape from it, given that the product is not stored in waterproof packaging. As a result, the packaging, the water activity of the two components and the storage conditions determine the loss or gain of water during storage. Water transfer in packaged food systems depends on the extent of vapour diffusion through the packaging and on internal diffusion within the multicomponent food. Typically, one of the two mechanisms controls the loss or gain of water during product storage. The study of water migration between different food components is crucial for modelling moisture changes over time and predicting product shelf-life. The phenomenon of water transfer in multicomponent foods, such as filled pasta, can compromise sensory balance and trigger undesirable reactions. Furthermore, it can change the ratio between the two components, which also has significant impacts on the legal labelling of the product. For this reason, moisture diffusion may be one of the main shelf-life limiting factors (Chu *et al.*, 2013). To the best of our knowledge, there are no studies modelling moisture transfer in high moisture multicomponent foods such as fresh filled pasta. Furthermore, shelf-life studies on this product have never

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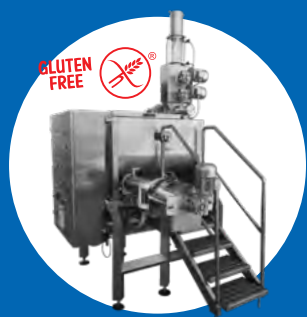
Nowadays, the needs in pasta factories are ever greater: production plants must be more compact, easily washable and highly efficient.

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considered the impact of water transfer during the storage of the packaged product.

The aim of the study was, therefore, to analyse the transfer of water in fresh filled pasta during storage, assessing, in particular, the effect of external relative humidity on the internal dynamics between pasta and filling. For this reason, in a bicomponent model consisting of fresh egg pasta (30% w/w) and a ricotta filling (70% w/w), water migration was evaluated under two different relative humidity conditions (RH 70% and 100%) for a period of approx. 50 days. The results make it possible to determine the desired water vapour permeability of the packaging and, thanks to the mathematical model developed, to improve shelf-life by modifying the filling formulation and the packaging material.

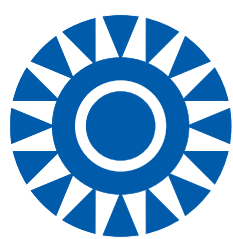
Materials and methods

The bi-component model of filled pasta was obtained by putting the filling in a plastic container, on the surface of which the pasta was then placed, maintaining a filling-to-total weight ratio of 0.7 g g⁻¹. In this way, water diffusion is one-way only along the vertical axis. Pasta and filling were produced at the VOLTAN S.p.A. pasta factory. (Olmo di Martellago, Venice,

Italy). The pasta was made from wheat flour, durum wheat semolina, eggs and water, and the filling was obtained by mixing the ricotta with rice flour, whey, salt and citrus fibre. The initial moisture content of the pasta was 38.5±0.08 g/100g with $a_w = 0.974 \pm 0.002$, while the filling had an initial moisture content of 49.3±0.08 g/100g with $a_w = 0.963 \pm 0.002$. Moisture content was assessed by gravimetric analysis at 130°C for 1 hour. Protein, lipids and ash were analysed according to ISTISAN 96/34 methods. Water activity (a_w) was measured with a dew point hygrometer (Aqualab CX3, Decagon Devices Inc., USA). Product density (calculated from the composition) was 1227 kg/m³.

The apparent water-holding capacity was determined by means of imbibition tests (Kauffman *et al.*, 1986). Approximately 2.5 g of each component (pasta and filling) were placed in containers (Ø 38 mm) in a thin layer (~2 mm), covered with an absorbent disc (Whatman, Grade 5). The containers were then closed and stored at 6.0 ± 0.5 °C. Every 24 hours, the absorbent paper discs were weighed until equilibrium was reached.

Adsorption isotherms were obtained from both the pasta and the filling using the static gravimetric method according to Iglesias & Chirife (1982). To this end, the



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dried samples (~0.8 g) were placed in jars with saturated salt solutions capable of maintaining a_w values of between 0.11 and 0.98, at 6.0 ± 0.5 °C. Equilibrium was considered to have been reached when the weight variation was $<1 \text{ mg/g}_{ss}^{-1}$. Adsorption isotherms were obtained by correlating the water content of the sample expressed in g_{ss}^{-1} with the equilibrium moisture content of the jar containing the saturated solution, using the GAB model (Labuza, 1984):

$$m = \frac{m_0 C k a_w}{(1 - k a_w) (1 - k a_w + C k a_w)}$$

where m is the moisture content (g water g_{ss}^{-1}), m_0 is the moisture content of the monolayer (g water g_{ss}^{-1}), k is the GAB constant relating to the properties of the monolayer, and C is the GAB constant relating to the properties of the multilayer. The Water Vapour Transmission Rate (WVTR) of the packaging used was estimated to be 0.263 and 0.441 g $\text{H}_2\text{O}/\text{m}^2 \cdot 24\text{h}$ respectively for the two RH levels, using the static gravimetric method (ASTM D 3079). For this purpose, 4 trays partially filled with anhydrous calcium chloride ($115.1 \pm 0.1 \text{ g}$) were stored at 6.0 ± 0.5 °C in two chambers with controlled RH (60-66.6% and 97.5-99.4%) and the weights of the packages were recorded

every week for 49 days. WVTR values were calculated by linear regression.

The bi-component model of filled pasta was packed in APET-EVOH-PE trays (300 μm thick), sealed with PET-PE-EVOH-PE (90 μm) top film (0.061 m^2 area), in a modified atmosphere (60% CO_2 and 40% N_2). A sensor system was used to monitor the relative humidity at five points (inside filling, above pasta, inside package, outside package, ambient environment). Samples were stored at 6.0 ± 0.5 °C, under two relative humidity (RH) conditions ($72.5 \pm 1.7\%$ e $97.8 \pm 0.8\%$).

Results

[Figure 1](#) shows the experimental data and graphical representation of the GAB model relating to moisture adsorption isotherms for pasta and filling at 6 ± 0.5 °C. The parameters calculated through the model are k (constant of GAB related to monolayer properties), C (constant of GAB related to multilayer properties) and m_0 (moisture content of monolayer). The k and moisture values of the monolayer indicate that the pasta has more polar sites on the surface capable of interacting with water molecules than the filling. The k values obtained suggest that the water molecules bound to the monolayer are more closely associated in the pasta ($k = 0.903$) than in

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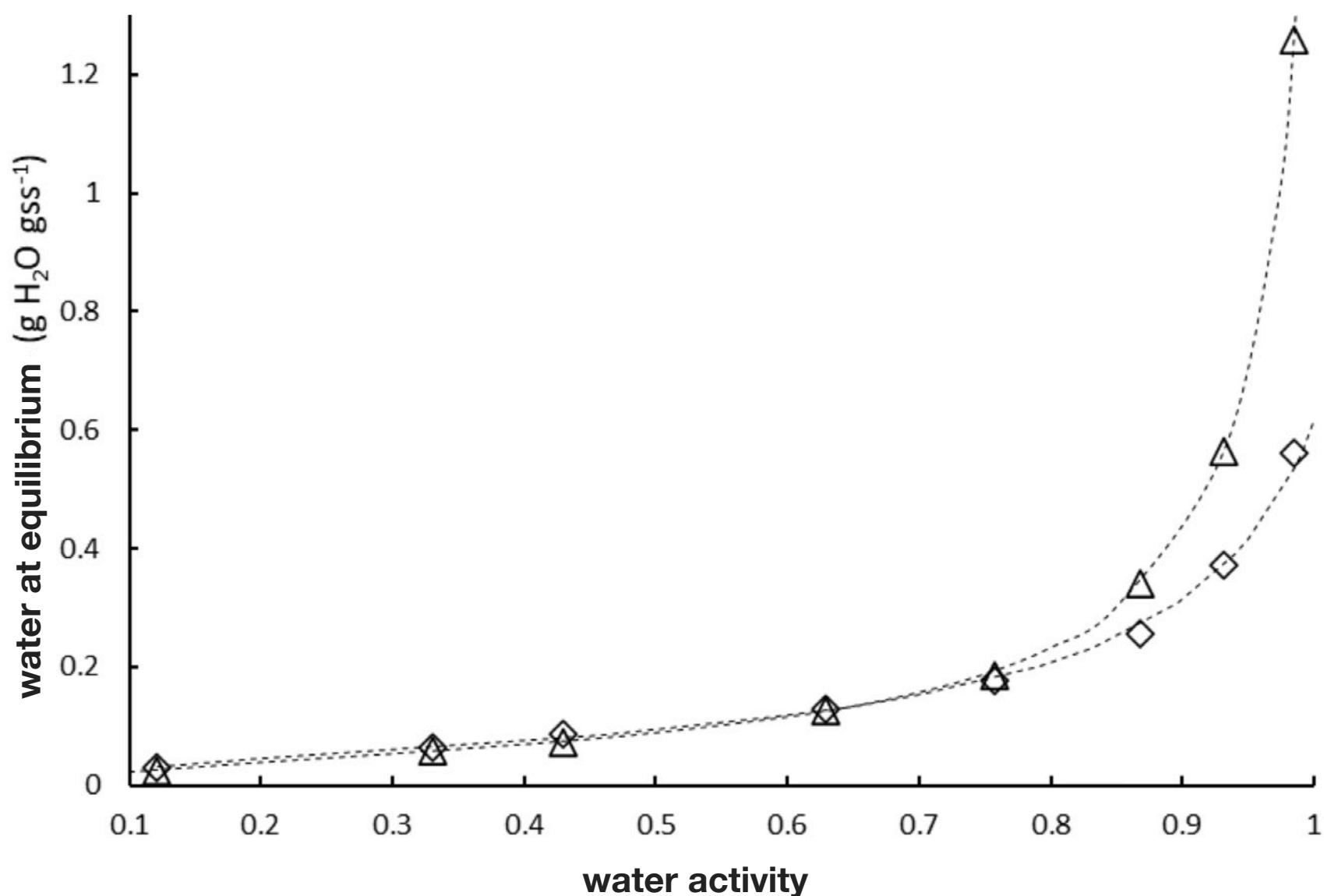
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Figure 1 ADSORPTION ISOTHERM AT 6°C OF PASTA (RHOMBUS) AND FILLING (TRIANGLE)



Experimental data and data predicted by the GAB model (dotted lines)

the filling ($k = 0.972$). The water content at the monolayer (m_0) was $6.04 \text{ (g } 100 \text{ g}_{ss}^{-1})$ in the pasta and $5.43 \text{ (g } 100 \text{ g}_{ss}^{-1})$ in the filling. The statistical criteria used (r , R^2 , p and E) indicated a good match between the experimental data and the GAB model prediction, which was therefore considered suitable for representing moisture absorption ($E < 5\%$, $r > 0.99$, $R^2 > 99$ and $p < 0.01$).

The variations in RH in packages stored at

an external RH of 72.5%, over the 49-day storage period, indicated a vapour flow from the inside to the outside of the package, whereas in those stored at 97.8% RH, moisture ingress from the external environment was observed. In each case, under both conditions, a moisture gradient was observed between the various layers (inside pasta, inside package, environment), confirming stratification of the water molecules and

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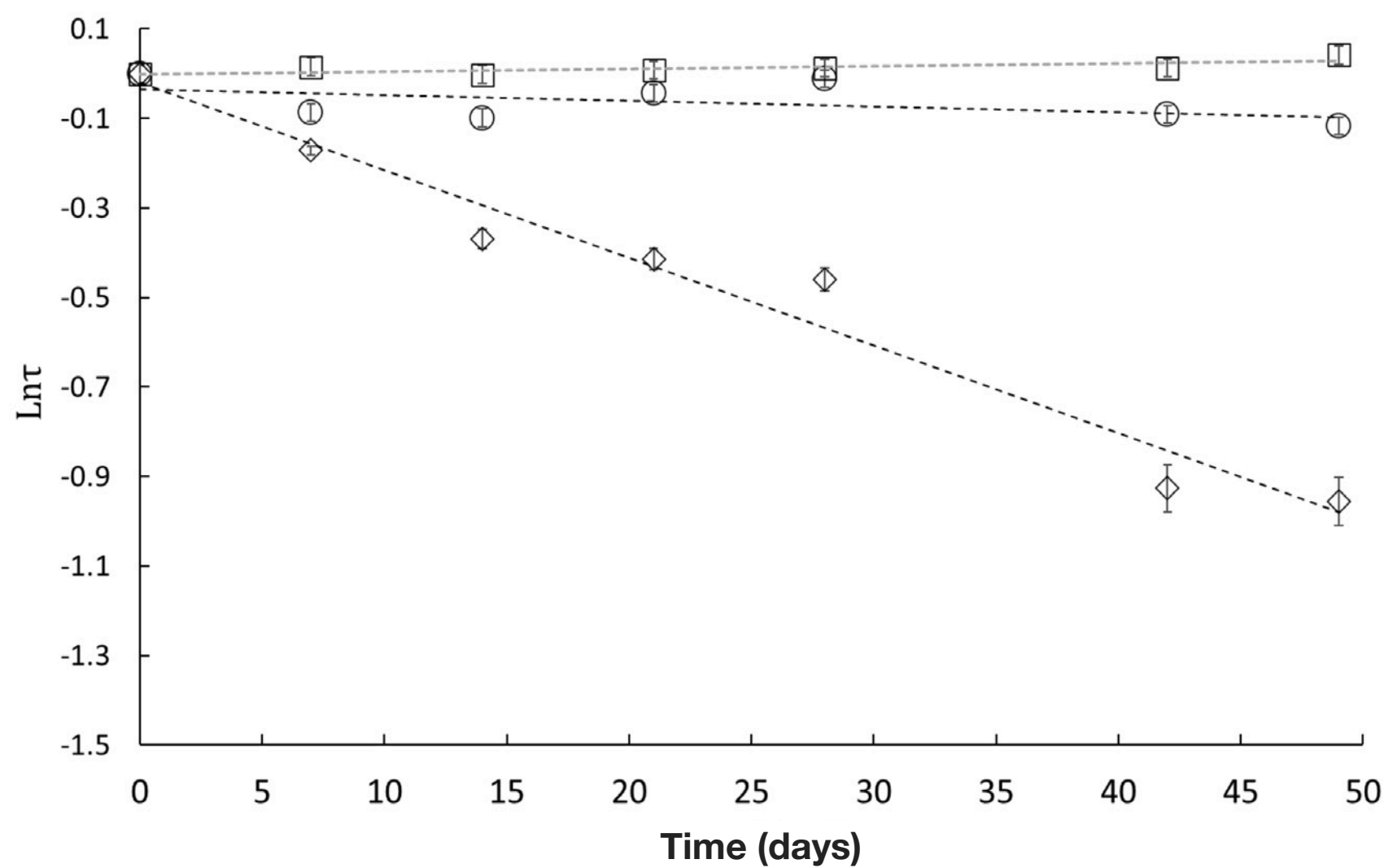


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Figure 2 VARIATION OF THE RATIO $\tau \left(\frac{m_e - m_i}{m_e - m_t} \right)$ OVER TIME IN THE THREE STORAGE CONDITIONS CONSIDERED: 97.8% (CIRCLE), 72.5% (RHOMBUS) RH% AND IMPERMEABLE CONDITIONS (SQUARE)



m_e water content at equilibrium ($g\ g_{ss}^{-1}$), m_i initial water content ($g\ g_{ss}^{-1}$) and m_t water content at time t ($g\ g_{ss}^{-1}$)

the presence of stagnant air hindering the homogeneous diffusion of water vapour. Our results concur with those obtained in previous studies (Gennadios *et al.*, 1994; Lamiani, 2010). The migration of water (Figure 2) shows that samples stored at 72.5% RH lost more water than those stored at 97.8% RH. Total losses were 1,021 g vs. 0.194 g,

respectively. Lower RH in the storage environment leads to greater evaporation of water from the product and its migration towards the external environment. When the product was stored in impermeable containers, there was no total loss of water, only an internal equilibrium between the pasta and the filling. In all cases, a net transfer of water from



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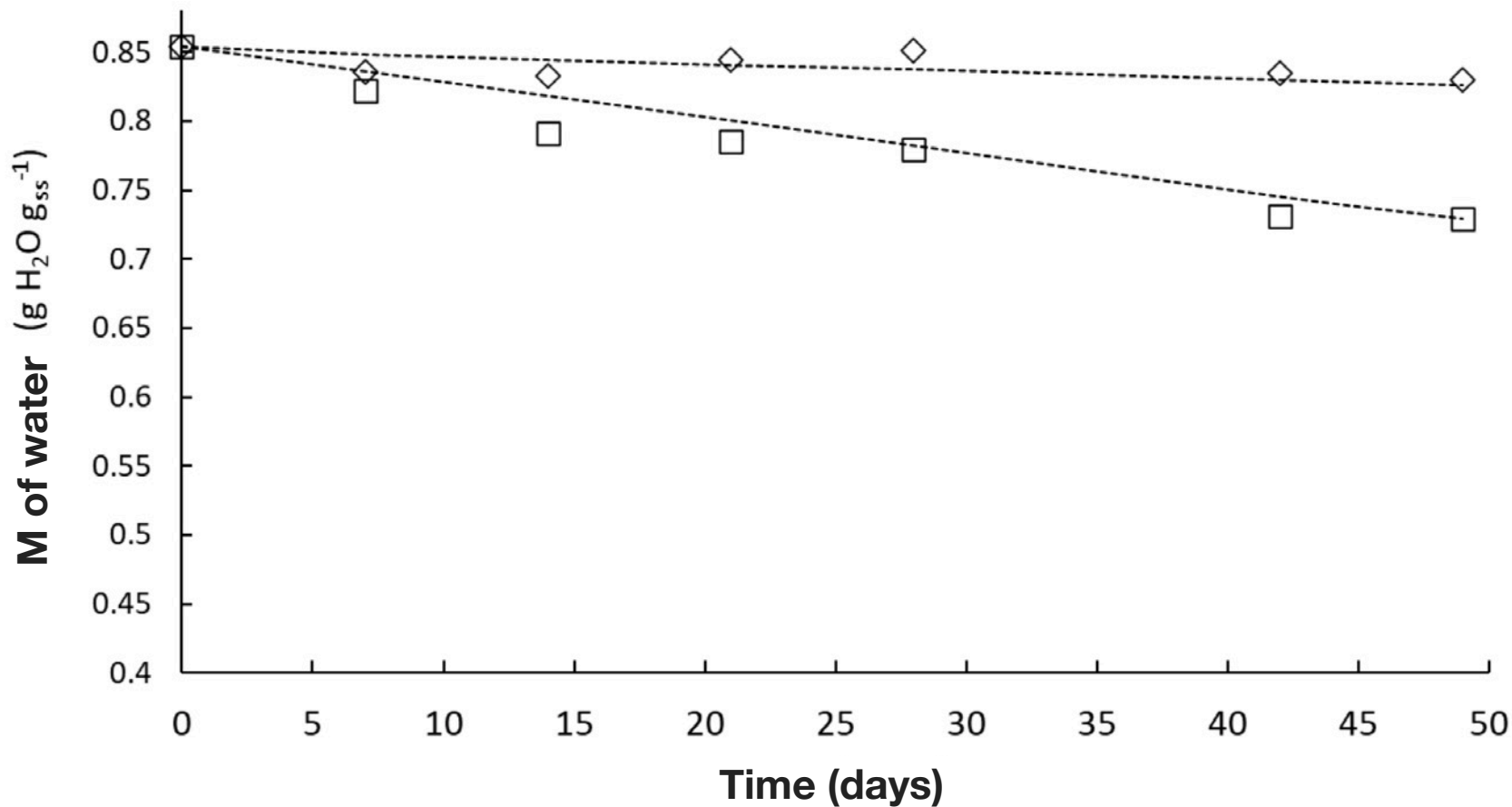
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Figure 3 COMPARISON BETWEEN THE EXPERIMENTAL VALUES OF THE TOTAL WATER CONTENT M ($\text{g H}_2\text{O g}_{\text{ss}}^{-1}$) OF THE FILLED PASTA MODEL FOR THE TWO STORAGE CONDITIONS 97.8% (RHOMBUS) AND 72.5% (SQUARE) RH% AND THAT CALCULATED USING THE MATHEMATICAL MODEL DEVELOPED (DOTTED LINES)



the filling to the pasta was observed during storage. In fact, as can be seen in [Table 1](#), the water content of the pasta increases in all the samples, including that stored in the impermeable system. The transfer of water between the two components is not directly related to the permeation of water through the packaging, suggesting an initial capillary-adsorption mechanism that is independent of the storage conditions. The data obtained suggest two distinct phases of water transfer:

a) initial phase with a rapid transfer of

water from the filling to the pasta;
b) second phase: evaporation of water from the pasta to the headspace affected by external storage conditions (RH%).

The difference in external RH resulted in different moisture gradients on the surface of the pasta (93.9% to 97.8% RH vs. 89.6% to 72.5% RH). This difference triggered a second phase of water migration, from the inside of the product towards the headspace, which reached equilibrium around 91% RH in both cases after 49 days.

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Table 1 WATER CONTENT IN THE PASTA AND FILLING (g g_{ss}⁻¹) AT THE START AND END OF THE STORAGE PERIOD UNDER THE THREE STORAGE CONDITIONS STUDIED (97.8%, 72.5% RH AND IMPERMEABLE)

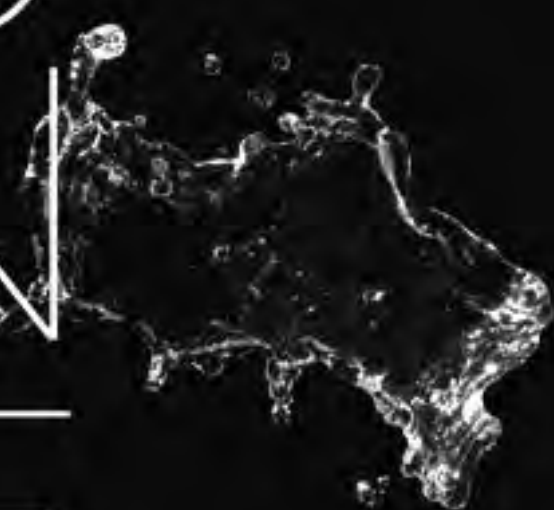
	Time 0	72.5 UR%	97.8 UR%	IMP
Pasta	0.626±0.007	0.692±0.005	0.850±0.007	1.010±0.008
Filling	0.972±0.006	0.749±0.006	0.817±0.005	0.630±0.007

The transfer of water within the system depends on whether or not the two components (pasta and filling) are in contact with each other. In the impermeable system, it was, in fact, observed that when the components are not in contact, the water moves solely as a function of the difference in water activity values between the two matrices, migrating from the pasta ($a_w=0.974\pm0.002$) to the filling ($a_w=0.963\pm0.002$) and reaching equilibrium after approximately 21 days. Contact, on the other hand, brings about a reversal of the transfer of water from the filling to the pasta apparently in contrast with the water activity value. In actual fact, the two phases both tend towards water activity at equilibrium by rebalancing the water content between them within the closed system. The displacement of water within a matrix can take place through different mechanisms depending on the chemical-physical characteristics of the matrix itself (diffusion, capillary flow, flow caused by gravitational forms, etc.). Pasta is a porous matrix which, after heat

treatment, exhibits a reduction in a_w and an increase in water affinity (Zardetto *et al.*, 2021; Zardetto *et al.* 2002). Therefore, it is possible that, due to these characteristics, contact with a matrix containing a high amount of free water – such as the filling – may lead to water transfer via capillarity and adsorption. This hypothesis is confirmed by the apparent water-holding capacity (WHC) value, which was much lower in the pasta ($0.0137 \pm 0.0015 \text{ g}_{ss}^{-1}$) than in the filling ($0.1144 \pm 0.0101 \text{ g}_{ss}^{-1}$). The transfer of water between the two matrices in contact brings about a variation in the filling-to-total weight ratio. As can be seen in [Table 2](#), after 50 days of storage under all three experimental conditions used, the ratio decreases with variations from 4 to 10%. The overall migration of water in the integrated product/packaging/environment system was calculated using the classical approach to shelf-life determination based on moisture exchange (Fava *et al.*, 2000; Lamiani, 2010) by introducing the GAB equation and three different gradients of ΔP into the general mathematical model to



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Table 2 VARIATION OF THE FILLING-TO-TOTAL WEIGHT RATIO AT TIME ZERO AND AFTER 50 DAYS OF STORAGE UNDER THE THREE STORAGE CONDITIONS STUDIED (97.8%, 72.5% RH AND IMPERMEABLE)

	Time 0	After 50 days (6±1°C)		
		72.5 UR%	97.8 UR%	IMP
Filling (g g ⁻¹)	0.7	0.62	0.66	0.6

account for the presence of the moisture gradient inside the package and in the environment. In [Figure 3](#) the experimental data obtained for samples stored at 6°C and 97.8% and 72.5% RH were compared with those predicted by the model. The mathematical model used accurately predicted the evolution of the water content (g g_{ss}⁻¹) of the model system within the packages, with low percentage error E% values (0.85 and 1.36 for samples stored at 97.8% and 72.5% RH, respectively).

Conclusions

In conclusion, the observed water transfer is not solely governed by the water activity value, but is influenced by several factors such as the structural differences between the two matrices involved (micro- and mesoporosity), the different water affinity of the pasta following the heat treatment to which it is subjected, and lastly by the moisture gradient between the inside and outside of the system. Contact between the pasta and filling is essential to trigger the first transfer, while external relative

humidity affects the final equilibrium at the end of the storage period. The results highlight a particularly important aspect for the formulation of fresh pasta. The water activity value of the filling is not sufficient to reduce the phenomena of water passing from one matrix to the other. Being high water content matrices with adsorption isotherms at a_w values above 0.90, characterised by strong variations in water content (g g_{ss}⁻¹) for small variations in the value of a_w, it is observed that even when fillings are formulated with water activities close – but not equal – to those of the pasta, significant water transfer can occur. Based on the first results obtained, it is therefore necessary to act on several factors capable of slowing down these diffusive phenomena. The results obtained in this study can serve as a solid starting point for future studies to delve deeper into what has been achieved in this initial phase. In particular, further trials should aim to reduce or modulate this phenomenon, e.g. through packaging design or changes in formulation.



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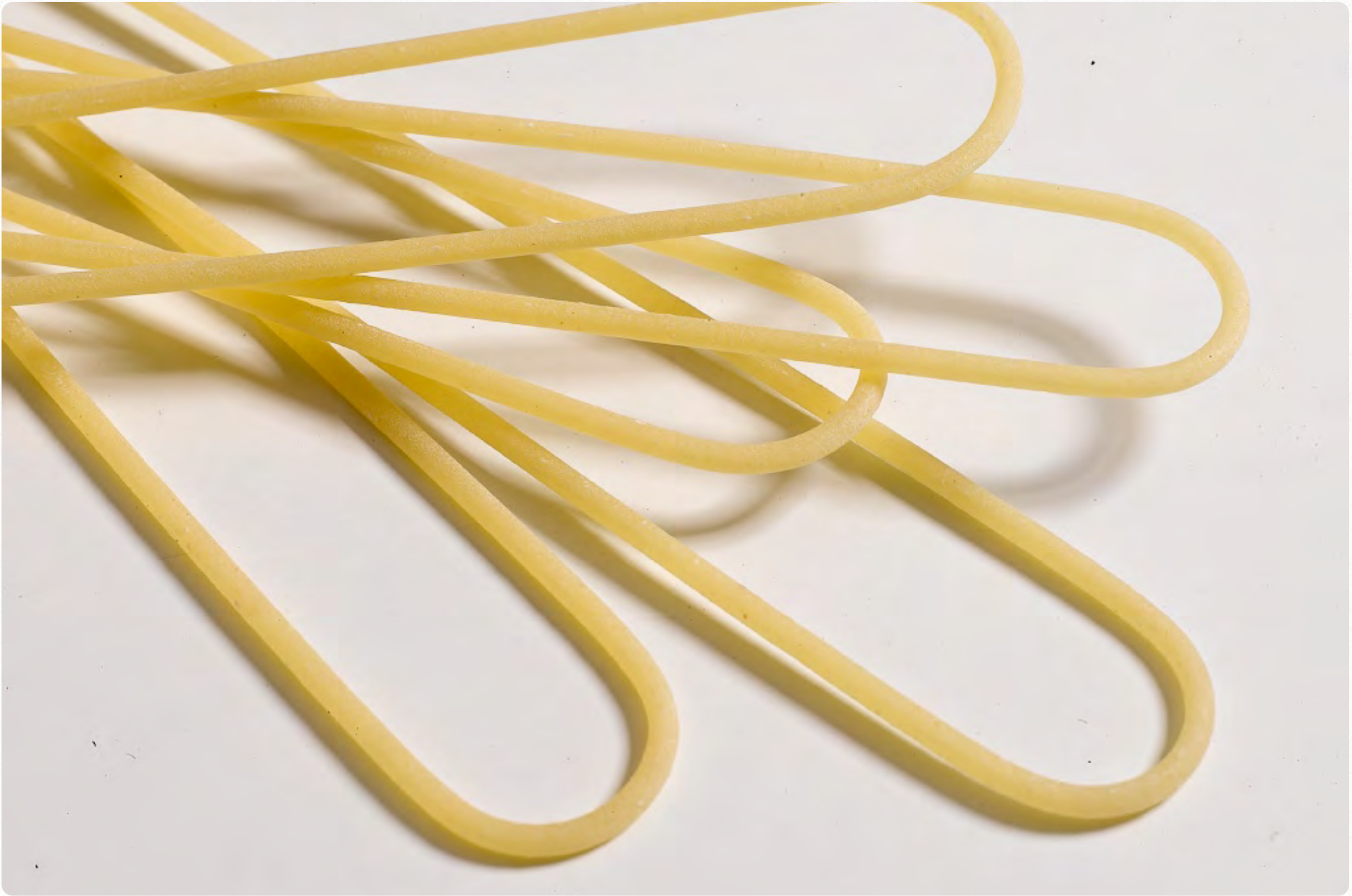
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4



In Istanbul, World Pasta Day 2025: pasta between tradition and future

Editorial team



From October 24 to 26, professionals and producers from around the world will gather in Istanbul to celebrate pasta under the banner of innovation and tradition.

The twenty-seventh edition of World Pasta Day will be held in Istanbul from October 24 to 26, 2025—an international event that celebrates pasta in all its forms each year. The 2025 edition, dedicated to the theme “From Tradition to Future,” will be an opportunity to explore pasta’s cultural heritage and its evolution toward the future, focusing on innovation, sustainability, and new consumption trends.

Organized by the Turkish Pasta Manufacturers Association (TMSD) and the Pasta Manufacturers and Industrialists Association (MÜSAD), in collaboration with the International Pasta Organisation, World Pasta Day will bring together producers, professionals, and leaders from the global pasta industry.

Over the course of three days, the event will feature a rich program of meetings, presentations, and discussions designed to promote pasta as a universal, accessible, and sustainable food. Once again, Pastaria will serve as the official media partner of the event, closely following the proceedings and providing extensive coverage, reinforcing its commitment to the international pasta community.

The official program will soon be published on Pastaria, along with interviews and in-depth features. All participation details will also be made available on Pastaria.



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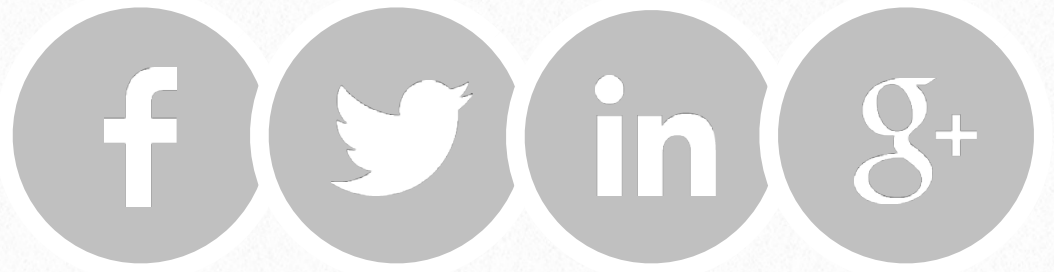
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5



New record for 2024: Italian pasta exports soar to €4.3 billion (+5.1%)

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Export volumes even higher, up 9.3% compared to 2023. What is worrying now are the implications of the ongoing conflicts and the uncertainties over prices, tariffs and currencies.

Record-breaking figures for Italian pasta exports in 2024, with a turnover topping €4.3 billion, up 5.1% year-on-year.

The figure emerges from the forecasts drawn up on the basis of ISTAT data, which show a positive trend across the board, with only a few instances of decline in the list of the top twenty recipient markets and only one negative indicator when the trend is analysed in terms of volume.

In fact, looking at the actual trade flows, even more laudable figures emerge. Suffice it to say that shipments of Italian pasta topped the 2.5 million tonne mark in total, marking a growth of 9.3% compared to the quantities recorded in 2023.

This is the second best result ever after 2020, the first year of the Covid-19 emergency, which, coinciding with the restrictive measures, gave a strong boost to domestic consumption of pasta, generating a knock-on effect on demand worldwide.

The success of the last twelve months was far from guaranteed, given the difficulties in the general economic environment and the geopolitical crises that have strongly affected developments in international trade, also from the logistics perspective.

“This result confirms the centrality of pasta in the agri-food sector,” comments the Unione Italiana Food, observing that the export share of national pasta production is now close to 60%.

It is worth noting that the differing pace between turnover and volume reflects a decline in average unit values of around 4%. This trend is linked to pasta price movements which – following the sharp increases in 2023, mainly driven by soaring production costs, especially for the procurement of raw materials – began a gradual downward adjustment last year. This trend is also confirmed by ISTAT’s findings, which certify, in contrast to food inflation, a strong reduction in consumer prices for pasta, which fell by 4.1% in April compared to the same month of the previous year.

The detailed data, as already mentioned, provide mostly positive trends for exports. Non-EU markets, however, are operating at almost double the rate of the EU, resulting in a balancing between the shares of the two areas, with only a marginal advantage in favour of the European Union.

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World	4,120,947	4,330,451	5.1%	2,355,541	2,574,195	9.3%
EU-27	2,188,020	2,268,257	3.7%	1,253,222	1,336,180	6.6%
Non-EU	1,932,927	2,062,194	6.7%	1,102,319	1,238,015	12.3%
Germany	673,262	712,716	5.9%	441,780	485,197	9.8%
United States	586,268	671,289	14.5%	269,078	326,884	21.5%
France	533,102	552,498	3.6%	297,726	312,909	5.1%
United Kingdom	471,177	468,249	-0.6%	285,331	294,265	3.1%
Spain	169,187	185,071	9.4%	73,153	82,667	13.0%
Netherlands	125,393	131,607	5.0%	66,525	70,346	5.7%
Belgium	116,478	107,376	-7.8%	59,554	52,573	-11.7%
Sweden	103,165	102,288	-0.8%	58,328	62,781	7.6%
Switzerland	95,707	97,890	2.3%	44,880	47,367	5.5%
Japan	95,220	92,208	-3.2%	67,915	70,332	3.6%
Canada	80,479	87,301	8.5%	37,626	42,793	13.7%
Austria	73,717	73,217	-0.7%	38,280	39,656	3.6%
Australia	75,800	69,472	-8.3%	35,995	38,454	6.8%
Poland	61,181	63,575	3.9%	36,299	40,236	10.8%
Brazil	42,431	47,012	10.8%	26,342	30,530	15.9%
South Korea	37,727	46,137	22.3%	26,673	33,528	25.7%
Denmark	44,175	43,314	-1.9%	22,898	24,063	5.1%
Israel	43,540	40,914	-6.0%	31,077	33,089	6.5%
Ireland	40,231	39,537	-1.7%	21,640	22,400	3.5%
Saudi Arabia	36,849	38,058	3.3%	31,022	37,003	19.3%
Czechia	31,620	35,075	10.9%	21,205	23,412	10.4%
China	28,244	30,673	8.6%	22,448	26,648	18.7%
Romania	25,488	28,135	10.4%	12,731	14,367	12.8%
Finland	29,156	27,357	-6.2%	15,097	13,544	-10.3%
Norway	28,162	26,506	-5.9%	14,016	14,714	5.0%
Portugal	23,442	25,968	10.8%	9,898	11,359	14.8%
Ukraine	20,051	25,888	29.1%	16,307	22,338	37.0%
Greece	24,464	25,126	2.7%	9,830	10,447	6.3%
Croatia	20,108	21,182	5.3%	13,514	14,447	6.9%
Slovenia	21,356	18,774	-12.1%	13,794	12,024	-12.8%
Source: ISTAT						

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Germany reaffirms its position as the largest export market in 2024: an interest backed up by decidedly positive figures showing year-on-year increases of 6% in currency and almost 10% in physical flows.

But the most dynamic, thanks to a process of continuous consumer loyalty, is the US market. Across the Atlantic, turnover grew by 14.5%, due to record quantities far exceeding the 300,000 tonne mark, a year-on-year increase of 21.5%. Shipments, and corresponding economic returns, are also on the rise in France, the third largest export market, while across the Channel, more critical operational and bureaucratic conditions and some currency interference have weakened exports to the UK, reducing revenues by a fractional 0.6%, notwithstanding a growth in volume of 3%, roughly a quarter of the growth observed in non-EU markets as a whole (+12.3%). In the Far East, South Korea and China are distinguished by outstanding performances, while Japan, tenth in the list of recipient countries, lags behind with a 3.2% drop in revenues.

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2025



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In a hundred years,
technologies have changed,
but passion and quality never have.

The only real discordant note is the particularly difficult situation in Belgium. This is another major export market, now seventh in the ranking, but also the only one among the top twenty recipients to experience a drop in volume – down a striking 11.7% – a figure that stands out even more when compared to the overall 6.6% growth in Italian pasta exports across the group of partner countries. With a record-breaking 2024 behind us, it is now vital to assess the potential implications of a situation that now appears less fluid, due to the impact of the economic and geopolitical crises, recently exacerbated by the Israeli-Iranian conflict in the Middle East, which, despite its short duration, could prove devastating on multiple fronts.

To this end, several indicators will have to be monitored: price and cost dynamics, which entail the need for a strategy to contain margin erosion; tariff risks, with custom duty levels still to be defined between the US and Europe; and the need to further diversify markets, focusing on Asia, the Middle East, Africa and Latin America, where demand is growing much faster than anywhere else. Not to mention the potential scenario of significant exchange rate volatility which has, in recent months, strengthened the euro against the US dollar.

Finally, according to the most recent data, the trends – as expected – are showing a marked slowdown Italian pasta exports still grew in volume in Q1 2025, but at the more modest pace of 1.3% compared to the same period last year. Turnover closed with a slight rise of 0.6%, leaving the trade balance surplus effectively unchanged.

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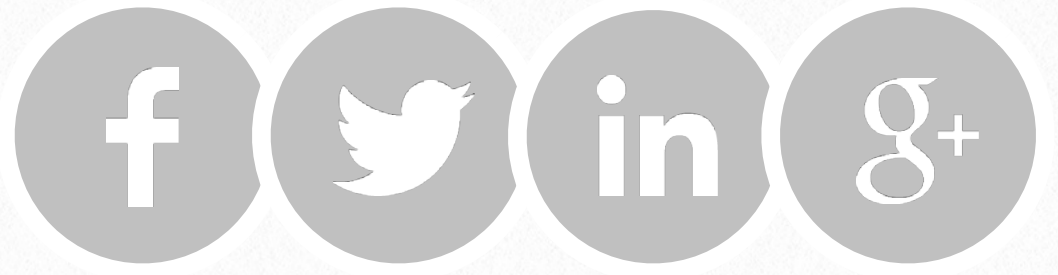
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6



Robosticks, Italtast's new system for pasta stick automation in long pasta production lines

Editorial team



This innovative system patented by Italtast makes it possible to automate the loading of pasta sticks into the production plant.

At the recent edition of Ipack-Ima, Italpast, the well-known Fidenza-based supplier of machinery and systems for pasta factories, presented Robosticks, an innovative, patented automation system designed for long pasta production lines. It is a compact machine, made entirely of stainless steel, which allows automatic loading of the pasta sticks from the spreading machine or pre-drying tunnel to the loading trolleys, guaranteeing a more efficient and safer handling of the line. Robosticks can also be incorporated at the end of the line, in combination with the stripping machine, from which it automatically picks up the sticks holding the dried pasta and then deposits them with great precision on the arms of the stripping machine. A configuration featuring an automated loading and unloading system for the stick-holding trolley is also available, for full cycle automation.

Equipped with accident-prevention safeguards, safety barriers and PLC-based control, the machine also features data interconnection capabilities with corporate supervisory systems and, if necessary, remote control, in line with Industry 4.0 requirements.

The versatility of the system is ensured by its compatibility with sticks of varying lengths (600, 1120, 1200 and 1500 mm),



making Robosticks ideal for a wide range of installations. Its integration in the line significantly reduces intervention time and labour costs, while improving overall process reliability.

With Robosticks, Italpast once again confirms its commitment to technological innovation at the service of pasta factories, offering cutting edge solutions to automate and optimise the most delicate phases of long pasta production.



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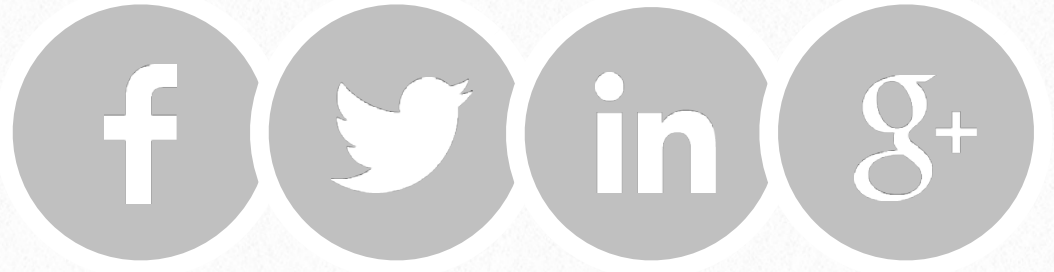
In 2020, Mulino Val D'Orcia decided to renew the partnership with Italpast, by installing a second plant to additionally increase the production, keeping unchanged the unique characteristics of raw materials.

Thanks to Italpast, Mulino Val D'Orcia consolidated its position as a leader in the artisanal pasta market, effectively responding to the growing request for high quality, authentic, and genuine products.

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7



Durum wheat, the IGC revises global estimates: less supply, more consumption

Pastaria Centre for
Economic Research



Production at 35.2 million tonnes; demand reaches seven-year high. With soft wheat global output at a record 805.6 million tonnes, but stocks at nine-year lows.

The frost emergency in Turkey provided the backdrop for this year's Durum Days summit on the durum wheat supply chain, held on 14 May at the Foggia Chamber of Commerce.

This news was greeted with concern because of its already confirmed impact on the world harvest, given Ankara's importance on the international scene, both in terms of production capacity and export volumes.

The extreme weather event, recorded on 10 and 12 April, left a trail of extensive damage, affecting various crops in Turkey, including apricots and hazelnuts. With regard to cereals, the most evident impact was on durum wheat, with the harvest reduced by half a million tonnes, according to the results of on-site inspections carried out in the areas affected. The new production estimate has now been lowered to 4 million tonnes, corresponding to a year-on-year reduction of over 9%.

This is yet another confirmation of the vulnerability of a crop that forms the backbone of the wheat-pasta supply chain, which is increasingly exposed to climatic crises, including unseasonal frosts, prolonged droughts and torrential rains, which not only impact yields in the field but also affect quality outcomes, with repercussions on the technical parameters of the grain.

According to forecasts by the International Grains Council (IGC), which have taken the crop losses in Turkey into account, global durum wheat production for the 2025-26 season should fall to 35.2 million tonnes, a year-on-year drop of 1.4%.

As well as the effects of the Turkish crisis, the figure estimated by UK analysts also factors in general production instability exacerbated by climate change, with regional shocks now seemingly capable of disrupting global production patterns.

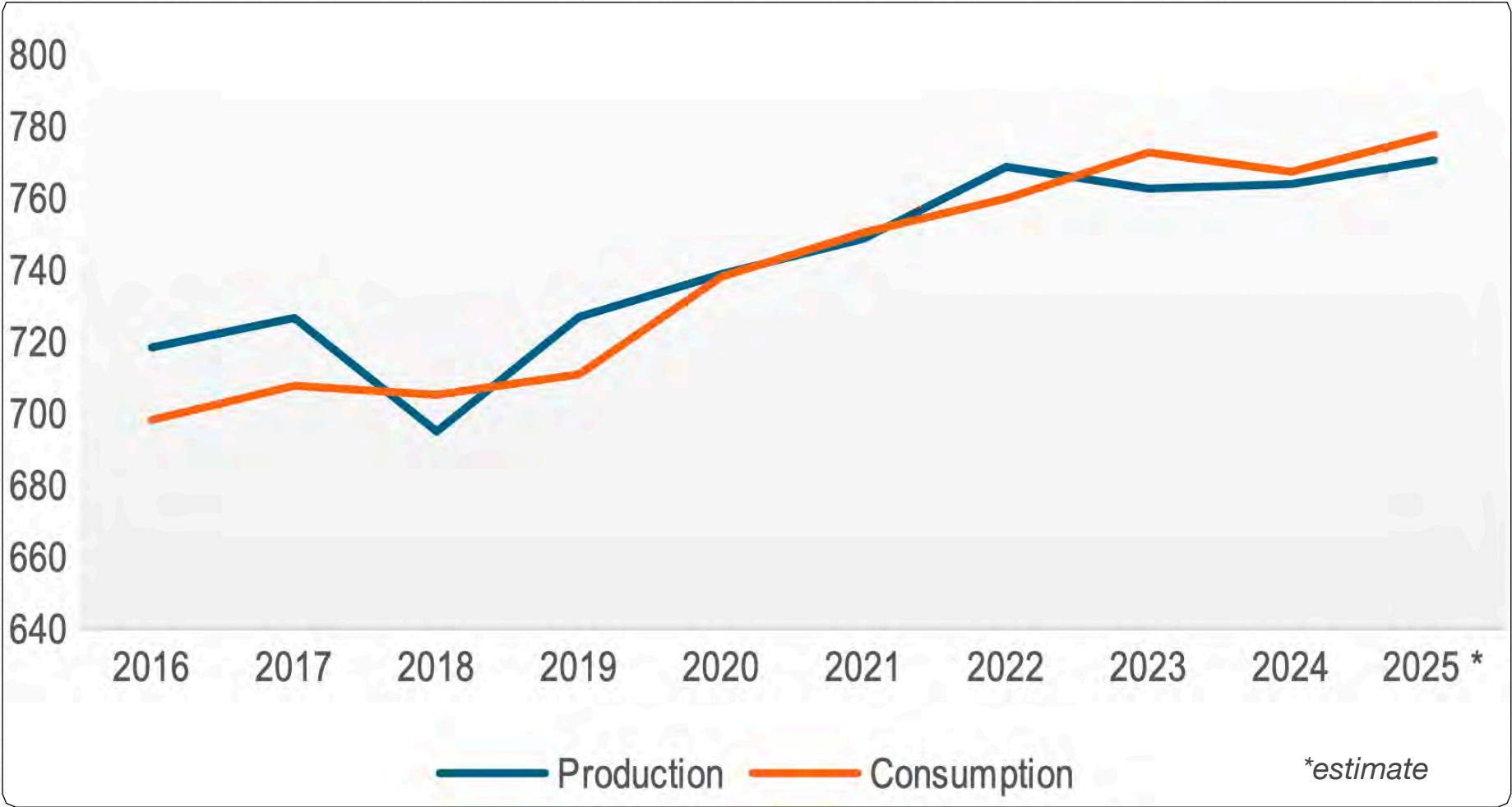
It should be noted that the downward revision of the production forecast is set against a backdrop of growing global demand, with consumption expected to reach 35.5 million tonnes (+1.1%), a seven-year high, 33.4 million tonnes (94%) of which will be for human consumption.

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Figure 1 TRENDS IN GLOBAL SOFT WHEAT PRODUCTION AND CONSUMPTION (MILLION OF TONNES)



On the basis of these assessments, a production deficit of approx. 2 million tonnes is envisaged, leading, implicitly, to a decrease in global stocks, which will drop by 5.4% to 6 million tonnes at the end of the season – a level below the historical average.

The IGC also predicts a reduction in global trade, forecasting 3.5% less in imports (8.7 million tonnes) compared to the 2024-25 season, also as a result of the collapse of Turkish exports (approx. -37%).

With exports (Statistics Canada estimate) of 4.6 million tonnes (down 8% year-on-year), Canada is expected to maintain its world leadership, while the EU

is expected to reduce its reliance on imported product by 10%. Mexican exports are at an all-time low (with volumes estimated to be down 78% compared to 2024) due to the poor outcomes of the harvest, which was severely impacted by the drought. Against this backdrop, Italy, although distant from the North American giants, will maintain a strategic role throughout the Mediterranean. According to CREA – Italy’s Council for Agricultural Research and Economics – the outlook is favourable, and a national harvest of around 4.2 million tonnes is forecast. This would correspond to a 20% increase



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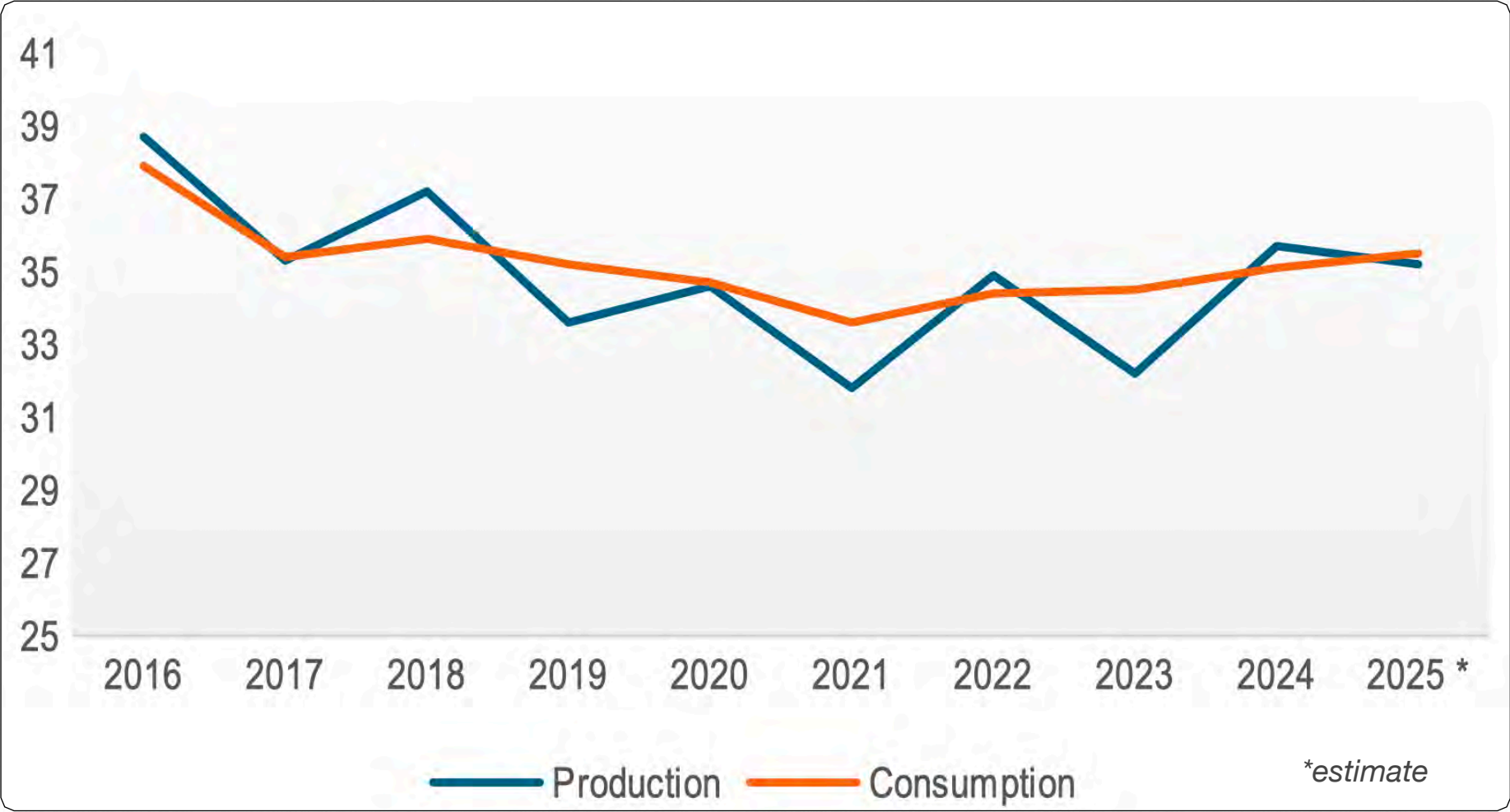
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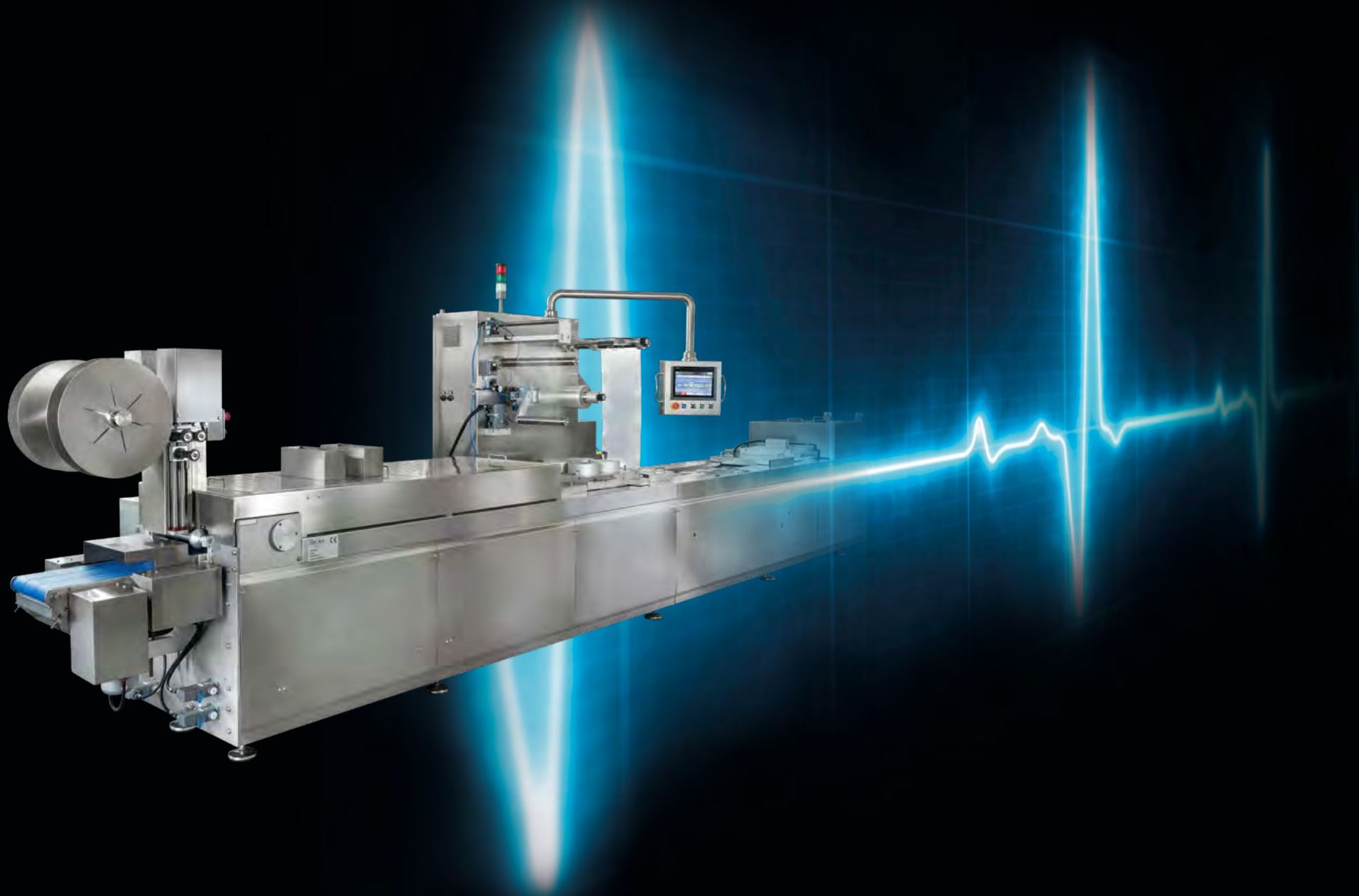
Figure 2 TRENDS IN GLOBAL DURUM WHEAT PRODUCTION AND CONSUMPTION (MILLION OF TONNES)



compared to 2024 and 12% over the five-year historical average. “This year’s figure,” state the CREA experts, “is due to the combined effect of a 9.5% increase in the areas cultivated (1.28 million hectares) and higher average yields than last year. In the Central-Northern Italy, heavy and recurring rain delayed sowing and agronomic operations, while in the South, after an uphill start due to drought conditions, improvements in the weather, characterised by sufficient rainfall and mild temperatures, permitted regular vegetative growth. Abundant domestic and EU production, the latter estimated at 7.9 million tonnes (+9.5%), should ease domestic price

tensions in the short term, although the market may tend to exhibit more volatility in the current climate of uncertainty. Also in the background is the 7% drop in Canadian production, estimated at 5.4 million tonnes, a forecast that could be further revised downwards due to the climatic impact of drought conditions, especially in the Saskatchewan region where approx. 80% of Canadian durum wheat is grown. At Durum Days, Italmopa – representing the industrial milling sector – emphasised the urgent need to overcome structural problems, particularly those affecting primary production, also by increasing the areas cultivated, in a context, however, of

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“globalisation of trade that is, and will in any case be, unavoidable”.

Returning to the IGC forecasts, considering also soft wheat (770.4 million tonnes), which accounts for over 95% of the global wheat harvest, analysts, despite revising their estimates downwards, confirm a record year, predicting a total production of 805.6 million tonnes, a year-on-year increase of 0.8% (+6.1 million).

Prospects in the European Union are excellent, with the 27 Member States expected to reach 135.6 million tonnes (up 13.6% compared to 2024), thanks to the good yields expected in the South-East and Spain and the strong recovery of France, after suffering a very bad year. Russia is expected to reach 81.7 million tonnes (+0.5%), notwithstanding some climactic difficulties. The outlook for Argentina is also good, with an increase of 7% in areas cultivated and a production of 20.5 million tonnes (+10.7%).

The imbalance between supply and demand will shrink global stocks (more than half of which are held by China) to a nine-year low of 262 million tonnes (-2.7%). After the slump of 2024-25 (-10%), world trade is expected to recover, rising to over 203 million tonnes (+5.3%). EU imports are expected to drop to 9.4

million (-12.6%) with Chinese imports soaring to 6 million (+66.7%).

As far as exports are concerned, Russia remains firmly in the lead with 43.1 million tonnes (+1.4%), followed by the EU (30 million, +19.3%), Canada (stable at 27 million) and Ukraine (16.3 million, a drop of 5.2%). Moscow is expected to maintain a competitive edge, especially over Europe, despite currency-related uncertainties and potential implications for global geopolitical developments.

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Agreement between the Anselmo Group (Facchini Impianti S.r.l.) and Food Machine Service S.r.l. to safeguard employment and ensure the production continuity of Food Machine Service S.r.l.

Press release

The Anselmo Group confirms its participation in the competitive acquisition process.

Anselmo Impianti S.r.l. and Facchini Impianti S.r.l. announce that, starting from November 2024, Facchini Impianti S.r.l. – a company fully controlled and specifically established by the Anselmo Group – has taken over the management of the company operating under the “Facchini” brand, through a lease agreement with

Food Machinery S.r.l. (formerly Facchini Group S.r.l.).

This operation is part of a restructuring process regulated by the Bankruptcy and Crisis Code, currently underway at the Monza Court, which aims, as a final outcome, to sell the company through a competitive procedure. Facchini Impianti S.r.l. has expressed its intention to

participate, respecting the rules in place, to ensure the industrial continuity of a historic brand in the fresh pasta production technology sector.

Thanks to this intervention, it has been possible to safeguard the jobs of 15 employees – and their respective families – avoiding operational discontinuities that could have compromised employment stability and the economic sustainability of the company. Additionally, the operation has allowed the entire supply chain, composed of numerous artisans and qualified industrial partners, to remain active, ensuring continuity for a well-established and highly specialized production ecosystem.

On the demand side, the management by Facchini Impianti S.r.l. has prevented interruptions in after-sales services, technical assistance, and the development of new solutions, maintaining continuity for existing customers and protecting the value of their investments, which would otherwise have suffered inevitable economic damages due to supply and maintenance blockages.

This press release complements and clarifies what has already been reported in previous articles promoted by the Anselmo Group, with the aim of providing a complete, transparent, and coherent picture of the ongoing operation,

respecting all involved parties and safeguarding the reputation and continuity of the Facchini brand.

The industrial project, supported by the know-how of the Anselmo Group and the collaboration of the Facchini family, aims to structurally relaunch the “Facchini” brand, preserving its historical, industrial, and commercial value. The synergy between technological innovation, financial solidity, and relational heritage is the cornerstone of an ongoing path toward fully restoring competitiveness in both the national and international markets.

The Anselmo Group reaffirms its commitment to investing in the enhancement of Italian excellence and in safeguarding employment, actively contributing to the growth and resilience of the entire manufacturing sector.

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