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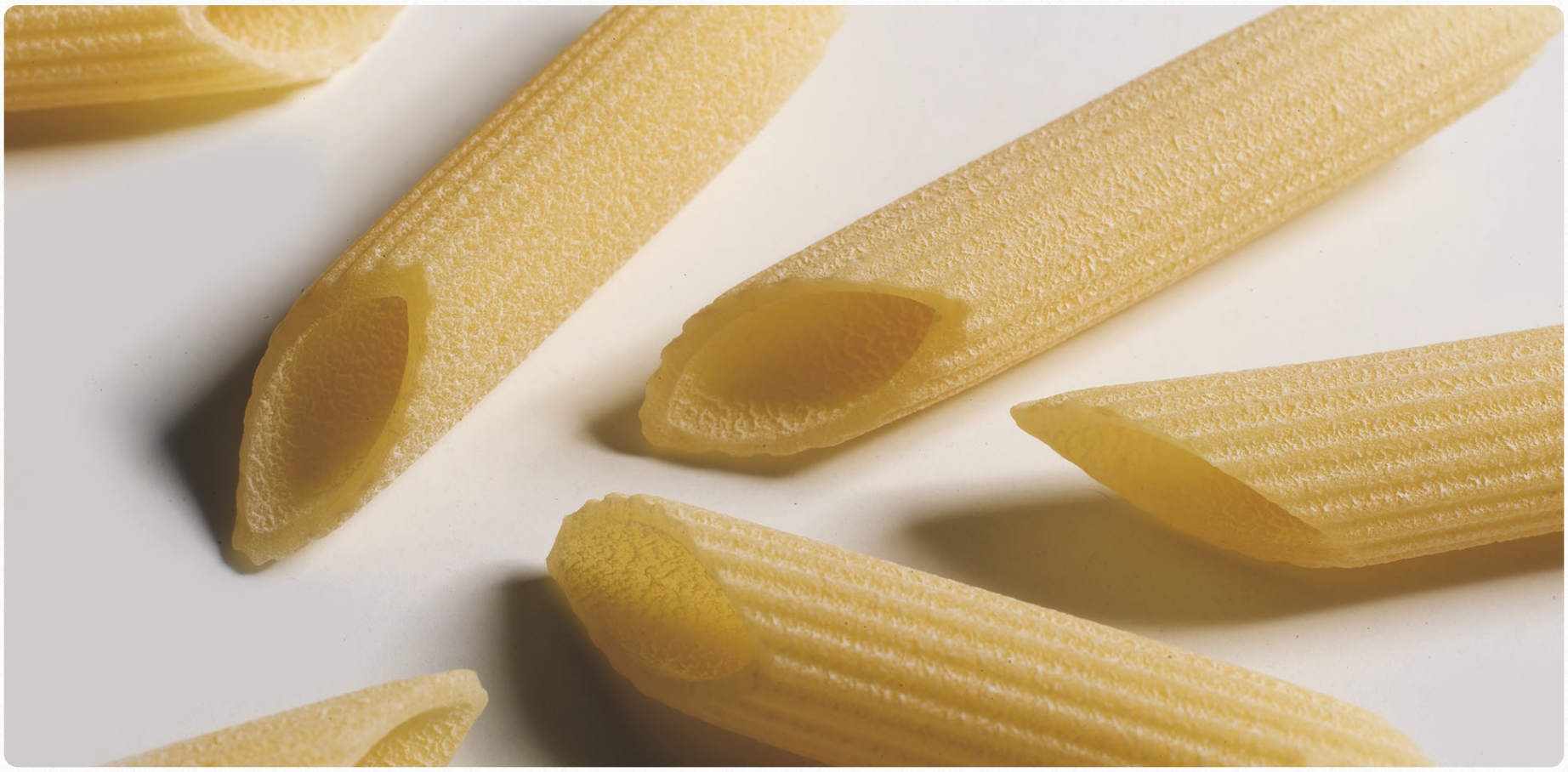

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Kinski Editori S.r.l.
registered office
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operational headquarters
Via Dall'Aglio 21/2 • 43122 Parma (Italy)
tel. +39 (0)521 1564934
fax +39 (0)521 1564935
Email redazione@pastaria.it
ROC no. 23238

EDITOR-IN-CHIEF
Lorenzo Pini

INTERNET SERVICE PROVIDER (ISP)
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PASTA TECHNOLOGIES GROUP

Via Martiri delle Foibe 13
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Fax: 0039 049 7968841
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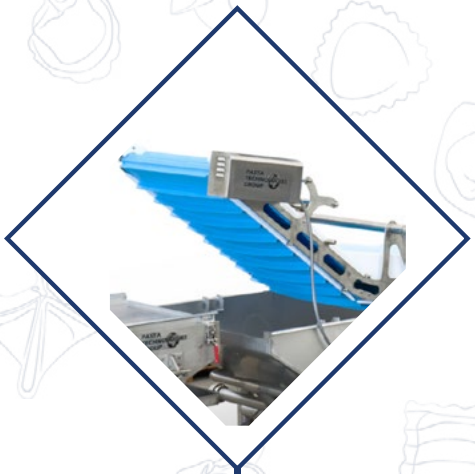

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The information and professional update resources that are part of the Pastaria network are freely distributed without charge thanks to the collaboration and support of leading companies operating on an international level to supply ingredients, semi-processed products, equipment and systems for manufacturing fresh/dried pasta, gnocchi and ready meals.

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1

Fiera Pastaria & Festival, new rules for taking part

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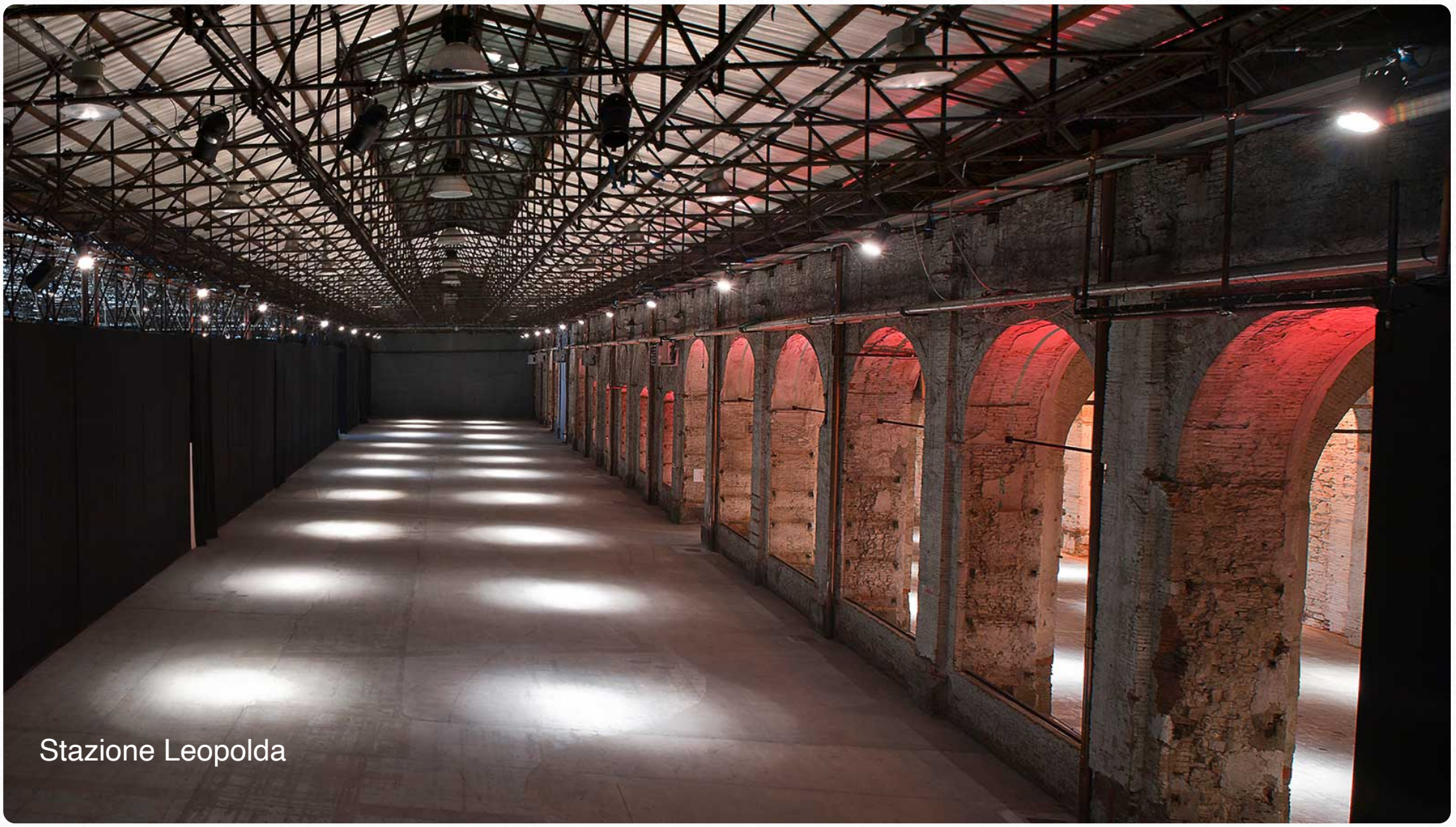

Stazione Leopolda

The rules for visiting Fiera Pastaria and taking part in the Pastaria Festival 2024 have changed: admission will be free, reserved for pasta manufacturers, with mandatory registration and subject to availability. The Pastaria event is scheduled to take place in Florence on 20 and 21 May 2024. All pasta manufacturers, of any type and origin, are invited to take part.

Everything is ready for Fiera Pastaria & Festival, the innovative event for the pasta supply chain born from the combination of the Pastaria Festival, the well-known and eagerly awaited conference event for professional training and refresher courses for operators, and Fiera Pastaria, the new trade fair that brings together the most important international suppliers of machines, systems, ingredients and services for pasta production.
The event, organised by the specialised magazine Pastaria, will take place in Florence on 20 and 21 May 2024.

Fiera Pastaria: machines, systems, ingredients, and services for pasta manufacturing on display

Not just technologies. Not just ingredients. Not just services.
The unique feature of Fiera Pastaria is the fact that the same exhibition hall will host the manufacturers of machines and systems (for both the production and the packaging processes), the suppliers of ingredients (from durum and common wheat manufacturers to the company supplying flavourings, from suppliers of egg products to suppliers of semi-finished products for fillings) and the suppliers of services.
International pasta factory suppliers trade fair – the payoff of the event – clearly indicates the product offer proposed by the innovative trade fair organised by Pastaria.
The stands of the most important companies operating worldwide in the field of supplies for pasta factories will allow viewing forming machines, semolina and flour, packaging lines, frames, heat treatment technologies, dies, flavourings, presses and much more besides.
By visiting Fiera Pataria, those who operate in the pasta production field (from the fresh pasta shop to the artisan workshop, to the large dry pasta or pasta-based ready meals industry) and in its supply chain, or those who intend to start a new business, will have the advantage of being able to find both the most interesting new technologies offered by the market and a significant variety of ingredients and semi-finished products offered by the best-known and long-established sector companies in a single exhibition area.

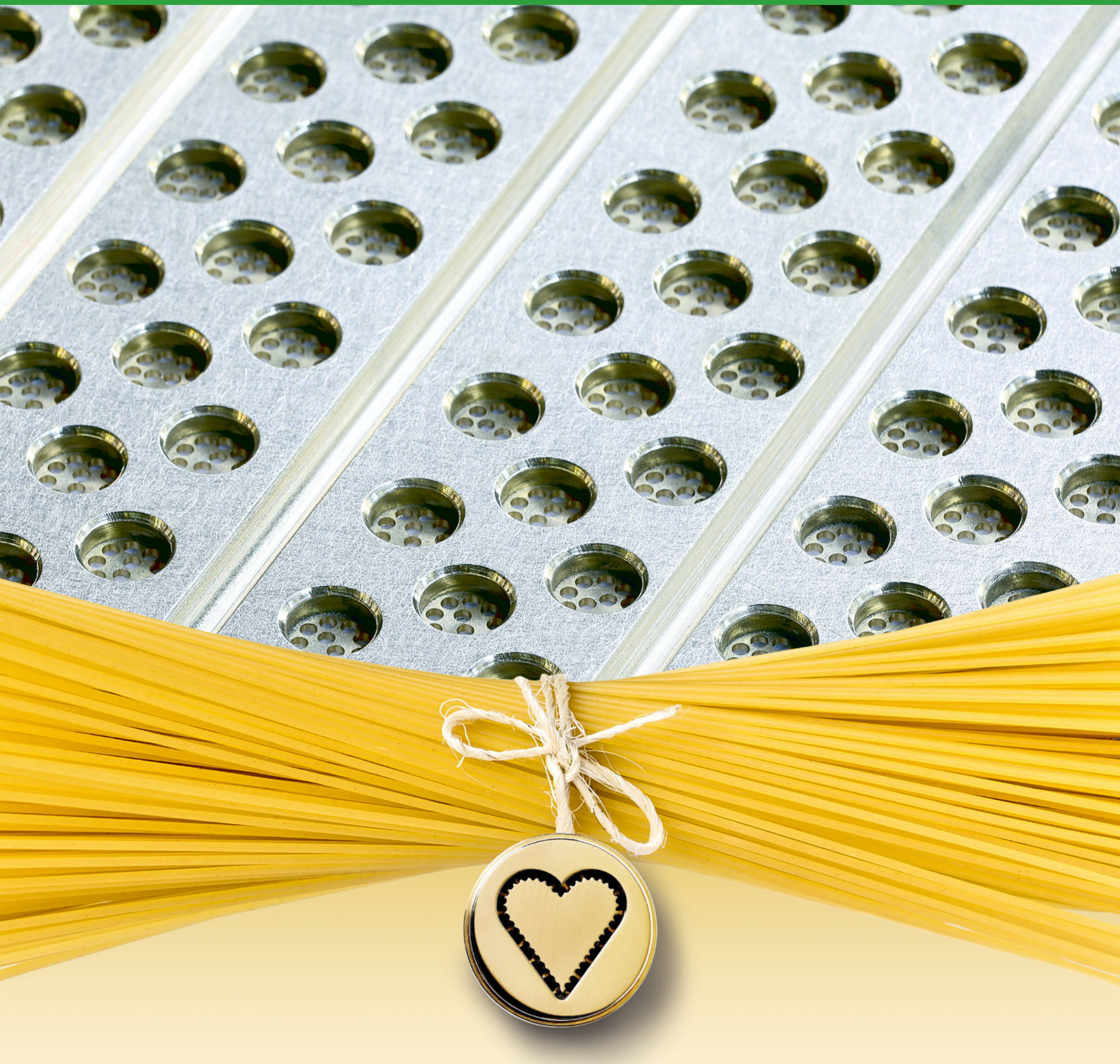

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Figure 1 HOME PAGE OF THE EVENT WEBSITE WWW.FIERAPASTARIA.COM

The eighth edition of the Pastaria Festival

The 2024 edition of the Pastaria Festival, the annual training, professional development and networking event for the pasta supply chain, will take place in Florence, once again in Stazione Leopolda, on the same days as the Fiera Pastaria.

Associations, professional bodies, universities, pasta factories, companies and experts will come together to share knowledge and skills in pasta production during two days of conferences, presentations, lessons, meetings, encounters and much more.

For the full programme see the article Pastaria Festival 2024. The programme can be found on the website (www.fierapastaria.com).

New rules for taking part

“The economic goal – breaking even in this

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first edition of Fiera Pastaria and the eighth edition of the Pastaria Festival – seems to have been achieved. This means that, with great satisfaction, we can dispense with the income from ticket sales and allow free admission to sector operators, as has always been the case for the Pastaria Festival and in line with our specialised publishing strategy which has free and open access to information as its most characteristic and distinctive feature."
This is how Lorenzo Pini, publisher and editor-in-chief of Pastaria, explains the change to the rules for taking part in the event previously published in the magazine (see article *Fiera Pastaria & Festival, all the information for taking part* in Pastaria International 2/2024, the print edition that came out in April).
With the adoption of these new rules for entry to Fiera Pastaria & Festival, it is no longer necessary to purchase a ticket, but registration is mandatory, following the procedure described on this page of the event's website.
The event remains reserved, by invitation only, for industry professionals including pasta manufacturers (and those intending to open a pasta factory) - as well as for exhibitors and sponsors - with mandatory registration free of charge.
Several types of registration are contemplated:

- *Platinum*: allows entrance to Fiera Pastaria, the exhibition area of the event, and to the Pastaria Festival, the area where the conferences are held. Entrance is valid for both days of the event (20-21 May 2024). Places are limited.
- *Gold*: allows entrance to Fiera Pastaria, the exhibition area of the event, for 2 days (20-21 May 2024). It does NOT include entrance to the Pastaria Festival conference area.
- *Silver Monday, 20 May*: allows entrance to Fiera Pastaria, the exhibition area of the event, for 1 day, MONDAY, 20 MAY. It does not include entrance to the Fiera on Tuesday, 21 May and does not include entrance to the Pastaria Festival conference area.
- *Silver Tuesday, 21 May*: allows entrance to Fiera Pastaria, the exhibition area of the event, for 1 day, TUESDAY, 21 MAY. It does not include entrance to the Fiera on Monday, 20 May and does not include entrance to the Pastaria Festival conference area.

Mandatory registration and invitation code

You must register on the Fiera Pastaria & Festival website to take part in the event. After choosing the type of admission, fill out the registration form with verifiable data.

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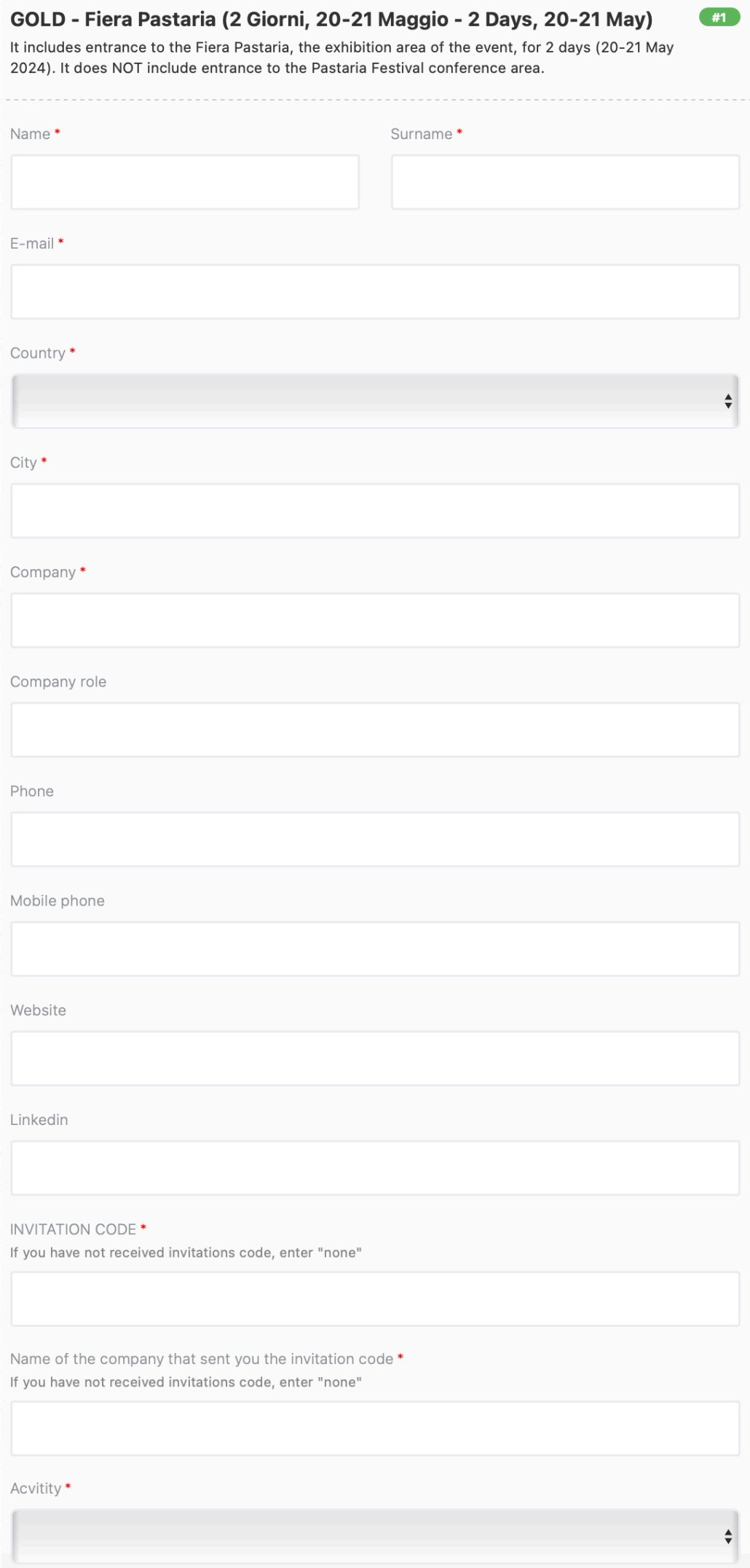
Figure 2 **FIERA PASTARIA & FESTIVAL REGISTRATION FORM (GOLD ENTRANCE)**



Pasta manufacturers can enter the following invitation code (reserved for pasta manufacturers) in the relative field:
BGKI9LHU
and enter “Pastaria” as the company from which the invitation was received.
We recommend that you come to the Fiera only after you have received confirmation of registration.

The event opening hours

The event will follow these opening hours:

Fiera Pastaria
Monday 20 May: 9.00 am- 6.30 pm
Tuesday 21 May: 9.00 am- 6.30 pm

Pastaria Festival
Monday 20 May: 9.45 am - 6.00 pm
Tuesday 21 May: 9.45 am - 6.00 pm

How to reach the Fiera Pastaria & Festival

Fiera Pastaria & Festival will take place in Viale Fratelli Rosselli 5 in Florence, near the city centre, and can easily be reached both by car

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and public transport.
Below we indicate the ways to reach the event venue.

By train
The nearest railway station is Porta al Prato, adjacent to Stazione Leopolda.
The Santa Maria Novella railway station is about one kilometre away: 5 minutes by taxi, 10 minutes by bus, lines 1 and 9 (departing from Via della Scala).

By plane
Amerigo Vespucci Florence Airport. The Stazione Leopolda is a 15/20-minute taxi ride from the airport.

By car
A11 Firenze-Mare motorway: Firenze Nord exit.
A1 Milan/Bologna and Naples/Rome motorway: recommended exit Firenze Nord. Continue along Viale Guidoni and Viale Redi, following the signs for the city centre, in the direction of Porta al Prato.

By bus
Lines: 29 - 30 - 35 - 57 (Stazione Leopolda stop).
Lines: C2 - C3 (Leopolda stop).

By tram
From Via Alamanni (behind Santa Maria Novella Station), Leopolda stop (first stop).

Hotels and transport

To receive assistance with booking hotels and train and plane tickets to visit Fiera Pastaria, you can contact the travel agency supporting the event:
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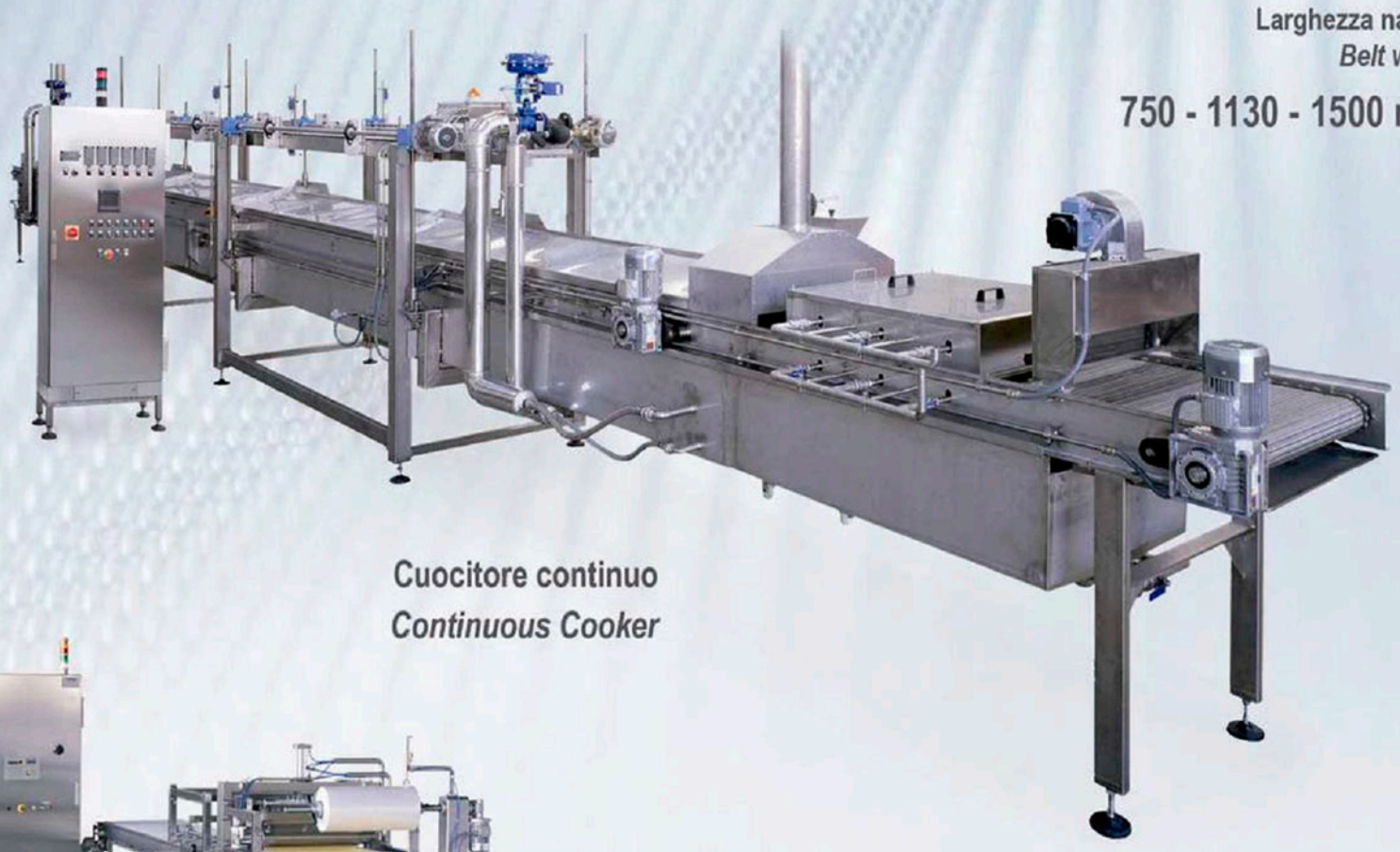
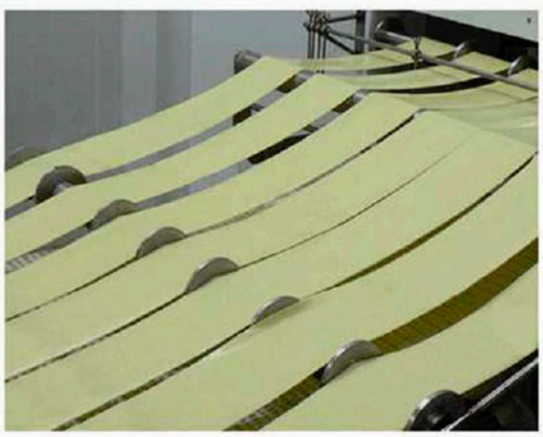


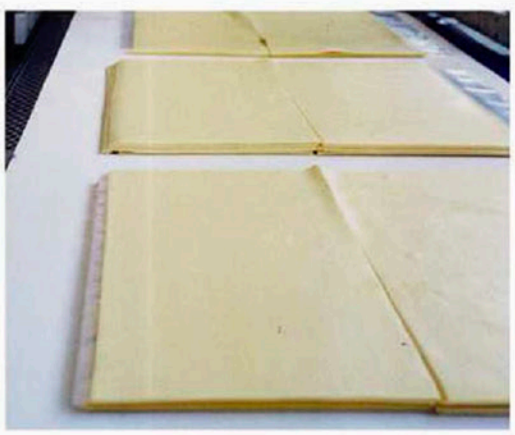
Cuocitore continuo
Continuous Cooker

Paste ripiene
Filled pasta

Interfogliatrice
Line for sheet with interleaf film



Sfoglie per Lasagne
Lasagne sheets



Sfoglia con interfoglio
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2

Optimisation of drying diagrams for reducing the Maillard reaction in pasta

Francesca Cuomo[1], Michela Quiquero[1], Maria Carmela Trivisonno[1], Martina Angelicola[1], Maria Cristina Messia[1], Emanuele Marconi[2,3]

1. University of Molise
2. Bio-Medical Campus of the University of Rome
3. CREA – Food and Nutrition Research Centre, Rome

The aim of this study was to evaluate the correlation between the variables of the high-temperature pasta drying process and thermal/nutritional damage. The pasta was dried by running cycles featuring timing differences in the appliance of the high temperatures, the maximum temperatures applied and the length of time to which the pasta was exposed to them. Various markers of the Maillard Reaction were evaluated on pasta samples taken at different times during the drying cycle, and it was shown that thermal damage can be reduced by appropriately modulating process conditions.

Introduction

High temperature (HT) (80-90°C) pasta drying is widely used at an industrial level because it reduces process times, increases productivity and improves the product's cooking quality. HT is, however, responsible for triggering the Maillard reaction (MR), the progress of which can be measured using specific markers and which depends on several factors, including the characteristics of the semolina, drying conditions, water activity (a_w), pH and relative humidity [1].

In the first stage of MR, the reducing sugars and amino acids in the semolina produce N-ε-maltulosyl-lysine and/or ε-fructosyl-lysine, also known as Amadori compound (AC) [2,3]. This can be assessed indirectly through the analysis of ε-N-2-furoylmethyl-L-lysine or furosine (FUR), an unnatural amino acid (not found in food) that forms in the hydrolysate of the sample. FUR is, therefore, an indicator of the early stage of MR and is widely used by sector operators to estimate the intensity of the thermal process and the associated nutritional damage (loss of available lysine blocked in the AC) [4,5]. In general, with regard to pasta, low-temperature drying leads to limited development of MR, with FUR values <100 mg/100 g protein, while HT drying can lead to FUR values in the range 400-700 mg/100 g protein [1,5].

Along with FUR, another method that can also be considered as a means for estimating thermal damage are the indicators of the advanced stage of MR, such as hydroxymethylfurfural (HMF), formed by the decomposition of AC into dicarbonyl compounds, pyrraline, formed by the reaction of these with amino acid residues, and glucosyl isomaltol (AGPF), formed by the degradation of AC,

In this study the pasta obtained from applying HT drying cycles had similar levels of MR as those of pasta dried at medium/low temperatures (low thermal and nutritional damage), maintaining the positive effects on the cooking quality of the product. The pasta was dried, varying the moment when the high temperature was applied, the duration of the drying cycle and the duration of the high-temperature exposure period. Pasta samples

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were taken at different stages of the drying process to monitor the formation of compounds in the early and advanced stages of MR, and the product from each of the cycles run was evaluated for cooking quality [6].

Materials and methods

Materials

The pasta was made from durum wheat semolina supplied by F. Divella Spa. Sample moisture, protein content and amylase activity were determined through the official testing methods [7]. The grain size of the semolina was determined by a laboratory sieve shaker (Bühler Group, Switzerland). Water activity, a_w, was determined using the AcquaLab system by Decagon Devices Inc.

For the calculation of the FUR values, the ground sample was hydrolysed with HCl 8 N at 110 °C for 23 hours. After hydrolysis, the samples were purified (on Sep-Pak C18 cartridge, Waters Corp.) and sent for HPLC analysis. HMF and AGPF were determined on the ground pasta samples, dispersed in sodium borate (0.1 M, pH 8.2) at 30°C for 30 minutes, then centrifuged at 5°C. 30 µl of Carrez I (15% p/v $K_4[Fe(CN)_6]$) and 30 µl of Carrez II (30% p/v $ZnSO_4 \cdot 7H_2O$) were added to 600 µl of supernatant and centrifuged at 5°C. The supernatant was analysed by HPLC. Blocked lysine was calculated as reported by Krause et al. [8].

Production of the pasta

The pasta (spaghetti, diameter 1.8 mm) was produced by a pilot system (Namadimpianti Srls) consisting of a press and a dryer. The drying process was governed by a control and programming unit operated with dedicated software, developed on a LabView platform by DRD Automazione srl (San Giovanni in Galdo, Campobasso, Italy). The pasta was dried by running drying cycles with different process conditions (Table 1).

All pasta-making was conducted by mixing the semolina with water (29%) under vacuum for 20 minutes, and extruding the dough with a Teflon die. During drying, pasta samples were taken at points B, C, D, E, F and G (Diagram in Table 1). Moisture, a_w, and furosine were monitored for each sample taken. Other markers such as HMF, AGPF, blocked lysine and colour were determined on the pasta at the end of the drying cycle. Colour was measured with a Minolta CR300 colorimeter using the CIELab color space.

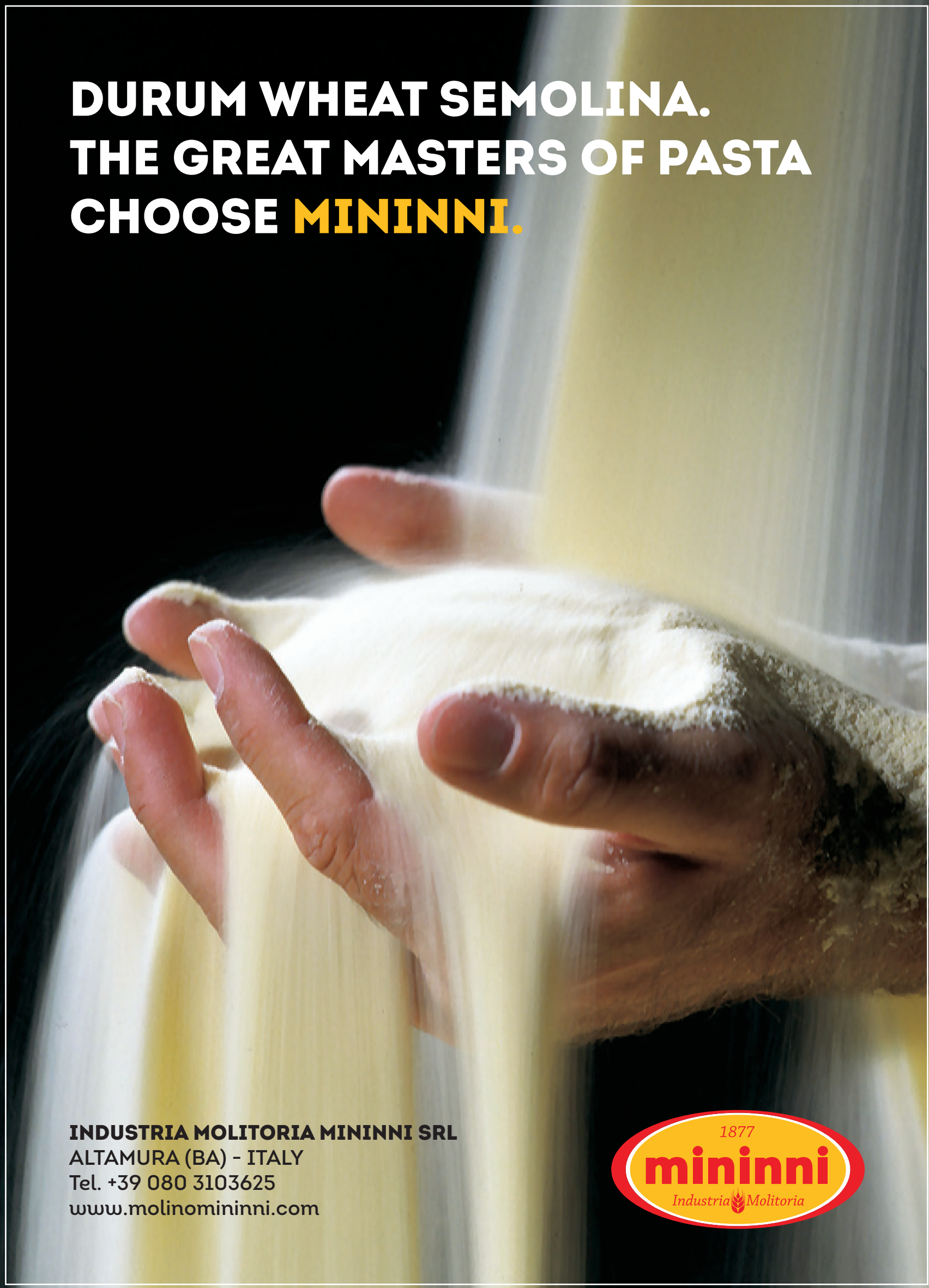

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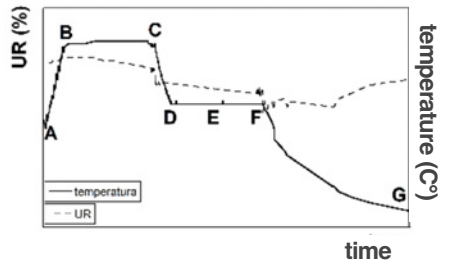
Table 1 **PROCESS CONDITIONS APPLIED IN THE VARIOUS DRYING DIAGRAMS (DD) AND EXAMPLE OF DIAGRAM APPLIED. THE CAPITAL LETTERS ON THE DIAGRAM INDICATE THE SAMPLING POINTS OF THE PASTA SAMPLES**

Drying Diagram	Tmax (°C)	Time for Tmax (min)	Exposure to Tmax (min)	Tmin (°C)	Total time (min)	Example of drying diagram
DE1	87	70	300	65	720	
DE2	87	30	210	65	720	
DE3	88	50	120	85	420	
DE4	88	50	120	72	420	
DE5	85	25	150	70	390	
DE6	81	25	150	70	390	

The time to reach Tmax is the time relating to section AB of the drying diagram; Tmax is the temperature applied in section BC; Tmin is the temperature applied in section DF; the total time is the time from A to F

Cooking quality

The optimal cooking time (OCT) and cooking quality were determined by the ISO 7304-1 method [9]. Cooking quality was assessed by applying a score of between 10 and 100. Spaghetti with a total score ≤40 was rated as being of poor or mediocre quality; > 40 to ≤ 50 not entirely satisfactory; 50 to ≤70 satisfactory; >70-80 of good quality and >80 of excellent quality. Total organic matter (TOM) was determined using ICC standard method No. 153 [7]. TOM values >2.1 g/100 g correspond to low cooking quality; 2.1-1.4 g/100 g to good cooking quality, less than 1.4 g/100 g to excellent cooking quality.
Texture analysis was performed using a Texture Analyser (TAXT2, Stable MicroSystems).

Statistical analysis

All determinations were carried out in triplicate and expressed as an average value. Analysis of variance (ANOVA) and the Tukey HSD test were applied to the results. Differences of $p < 0.05$ were considered significant.

Results and discussion

The semolina used in this study had characteristics compatible with the production of high quality pasta: more than 45% coarse-grained particles (> 355µm), low content of damaged starch (3.9% dw), low amylase activity (0.09 CU/g dw), 13.9% dw (Nx5.7) protein, dry gluten of 7.9 g/100g dw, gluten index of 97, a_w of 0.71 and FUR of 10 (mg/100g protein) [11].

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Table 2 shows the moisture, a_w and furosine values for the pasta, measured at different stages and under different drying conditions. For the sake of simplicity, only the sampling points most representative of the changes recorded during drying have been selected (B, C and G).
The moisture (14.1%) and a_w (0.666) values at the initial sampling point (B) of DD1 set the conditions for the triggering of MR, so much so that FUR reaches very high values already at the start of the drying cycle (138.1 mg/100 g protein). In the subsequent cycles from DD2 to DD6, reducing the time to reach Tmax from 70 min to 50 min or less, the pasta sample taken at point B corresponds to higher moisture and a_w values and consequently lower FUR levels.
The samples taken at the end of the exposure period at Tmax (sampling C) showed a significant reduction in moisture and a_w, which varied according to Tmax and residence time at that temperature. Observing the final FUR values measured at sampling points G (DD1 to DD6), it can be observed that, under DD6 conditions, even when using high temperatures, the pasta exhibits FUR values typical of pasta dried at medium/low temperatures (approx. 200 mg/100 protein). Overall, by modulating the drying conditions (from DD1/DD3 to DD6), a 50% reduction in the FUR value was reached on the final pasta.

Table 2 AVERAGE VALUES OF MOISTURE, a_w, ND FUR VALUE IN THE SAMPLES TAKEN DURING THE DRYING PROCESS AT SAMPLING POINTS B, C AND G, AS PER THE NOTATION IN THE FIGURE IN TABLE 1

	Moisture (%)			a_w			FUR (mg/100g proteins)		
	B	C	G	B	C	G	B	C	G
DE1	14.1^{a}	12.1^{a}	10.3^{b}	0.666^{a}	0.634^{a}	0.491^{b}	138.1^{f}	353.5^{d}	460.4^{f}
DE2	20.3^{d}	12.4^{b}	10.0^{a}	0.899^{c}	0.618^{a}	0.445^{a}	20.3^{c}	351.3^{d}	376.7^{d}
DE3	19.4^{c}	12.6^{c}	10.0^{a}	0.916^{c}	0.701^{c}	0.506^{bc}	27.8^{e}	291.9^{c}	442.4^{e}
DE4	18.8^{b}	12.4^{b}	10.0^{a}	0.871^{b}	0.652^{b}	0.457^{a}	26.3^{d}	283.5^{c}	349.3^{c}
DE5	25.3^{f}	13.6^{e}	10.9^{c}	0.944^{d}	0.733^{d}	0.522^{c}	13.4^{b}	202.8^{b}	291.2^{b}
DE6	24.6^{e}	13.2^{d}	11.1^{d}	0.947^{d}	0.685^{c}	0.553^{d}	11.1^{a}	141.7^{a}	203.5^{a}

Different lower case letters within the same column indicate statistically significant differences ($p < 0.05$) for each sampling point

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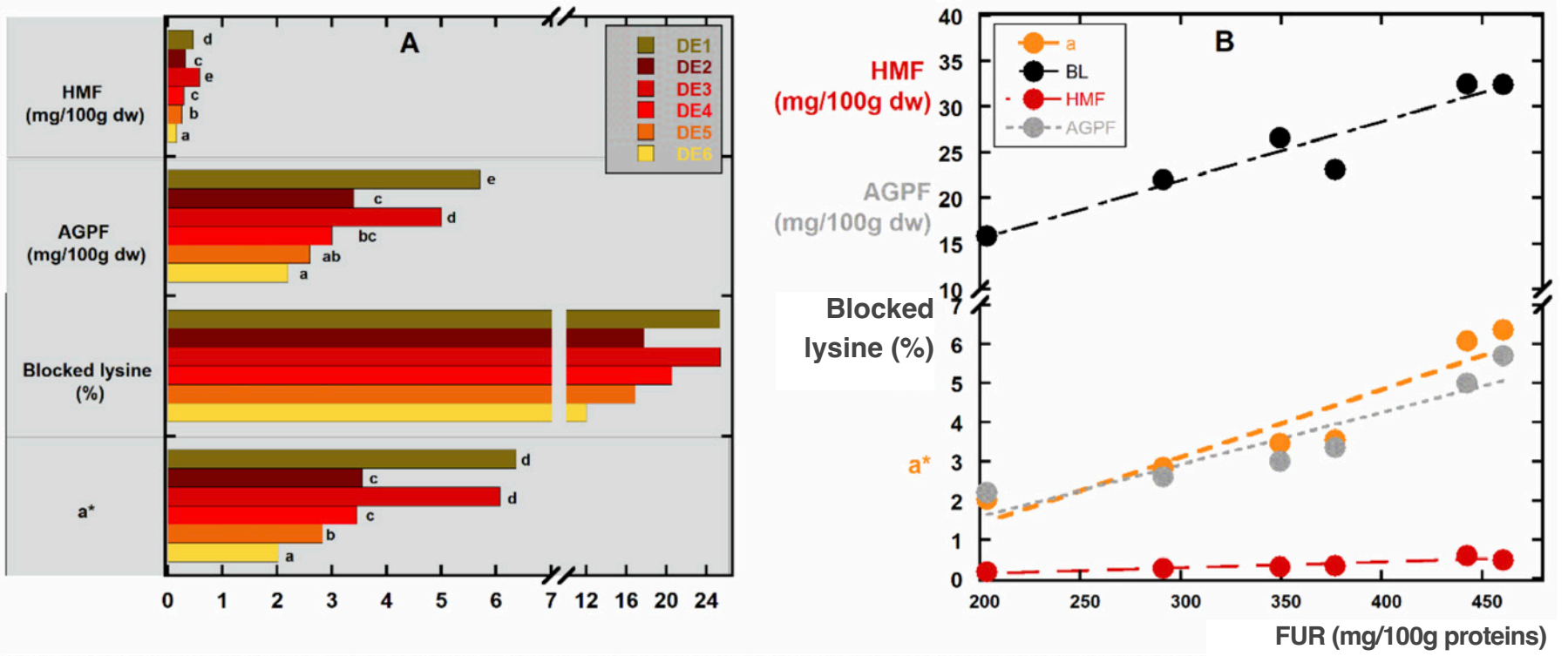
Figure 1 (A) VALUES OF HMF, AGPF, BLOCKED LYSINE AND RED INDEX ON THE PASTA OBTAINED AT THE END OF DRYING CYCLES DD1 TO DD6. (B) CORRELATIONS BETWEEN FUR AND THE OTHER INDICATORS (HMF, AGPF, BLOCKED LYSINE AND a*)



Different lower case letters on the bars of the values of the different indicators indicate statistically significant differences ($p < 0.05$)

Other MR indicators

Blocked lysine indicates the percentage of lysine no longer available because it is irreversibly locked up in the AC. Drying the pasta at low temperatures generally blocks about 7 % of the total lysine, and HT can make more than 30 % unavailable [12]. In the DD6 cycle, notwithstanding the typical HT drying conditions, a reduction in blocked lysine levels from 25% (DD1) to approx. 12% (DD6) was achieved (Figure 1A), so that nutritional damage was reduced to values closer to those at low temperature drying.

The advanced stage MR markers monitored in the pasta, i.e. HMF and AGPF, are chemical species for which there are no legal limits and are, moreover, water-soluble species [13,14] so it is conceivable that both, if present, are then lost during cooking of the pasta. With regard to both HMF and AGPF levels, a decrease in the final pasta from DD1 to DD6 was observed, confirming the mitigation of MR, also confirmed by the reduction in the red a* index.

Optimised conditions for the DD6 process resulted in the reduction of advanced stage MR products to negligible concentrations, with no impact on human health [15]. Figure 1B shows the straight correlation lines between FUR and the

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Table 3 OPTIMAL COOKING TIME (OCT), COOKING QUALITY, TOTAL ORGANIC SUBSTANCE (TOM) AND TEXTURE ANALYSIS OF DRIED PASTA UNDER DIFFERENT CONDITIONS

	DE1	DE2	DE3	DE4	DE5	DE6
TOC	13'55"	14'05"	13'40"	13'30"	13'05"	13'05"
Cooking quality						
Texture	90^{bc}	84^{ab}	91^{c}	82^{a}	83^{a}	87^{abc}
Starch release	80^{b}	78^{ab}	78^{b}	79^{ab}	79^{ab}	76^{ab}
Clumping	79^{a}	87^{b}	73^{a}	78^{a}	76^{a}	77^{a}
Total score	83^{a}	83^{a}	81^{a}	80^{a}	79^{a}	80^{a}
Final judgement	Excellent	Excellent	Excellent	Good / Excellent	Good	Good / Excellent
TOM (g/100g pasta)	0.937^{d}	0.782^{bc}	0.697^{a}	0.748^{ab}	0.731^{ab}	0.833^{c}
Texture analysis						
Texture (N)	6.30^{b}	6.32^{b}	6.36^{b}	6.06^{ab}	6.11^{ab}	5.76^{a}
Tensile load (N)	0.36^{a}	0.38^{a}	0.35^{a}	0.30^{a}	0.35^{a}	0.32^{a}
Flexibility (N)	0.60^{a}	0.56^{a}	0.62^{a}	0.55^{a}	0.57^{a}	0.58^{a}

Different lower case letters within the same column line indicate statistically significant differences ($p < 0.05$)

other markers and parameters considered in this study. It is therefore clear that HMF, AGPF, blocked lysine and red index are all parameters that directly correlate with FUR levels and vice versa.

Cooking quality of the pasta

The cooking quality of pasta can be affected by different drying conditions and can be assessed by sensory analysis, chemical methods and instrumental texture analysis. The results of the cooking quality assessed by sensory and chemical methods are shown in Table 3. The optimal cooking time (OCT) was longer for the pasta from drying cycles conducted at higher temperatures and for longer, where the incidence of MR was higher. The final judgement on the cooking quality of the pasta in the different drying cycles ranged from excellent to good/excellent.

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Furthermore, for the samples dried at a Tmax of 87 or 88 °C (DD1 to DD4), the texture, starch release and clumping values were very similar to those of the pasta produced applying a Tmax of 85 or 81 °C (DE5 and DE6).
The evaluation of TOM gave low values, which varied within a very narrow range (from 0.697 to 0.937 g/100g of dry pasta), confirming the high quality of the cooked pasta deriving from all the drying cycles.
The instrumental determination of the structure of spaghetti was carried out on cooked samples by evaluating the texture and tensile strength, and on raw pasta by evaluating flexibility. The instrumental values of texture and tensile strength showed that the variations in the drying cycles did not affect the instrumental behaviour of the raw and cooked pasta.

Conclusions

In this study, it was demonstrated that by administering the high temperatures in the very early stages of the pasta drying diagram, when water activity and moisture are still high (a_w > 0,85 and moisture > 15%), it is possible to achieve significant mitigation of the effects of MR in the final product (FUR~200 mg/100 g protein). The reduction in thermal damage was also demonstrated by the percentage of blocked lysine (< 12%) and the marker values of the advanced stage of MR (HMF and AGPF). These operating conditions, moreover, also enabled the pasta to maintain an optimal cooking quality.

Note

For further details: Cuomo, F., Quiquero, M., Trivisonno, M.C., Angelicola, M., Messia, M.C., Marconi, E. (2023). *Mitigation of Maillard reaction in spaghetti by optimization of the drying conditions*. LWT - Food Science and Technology, 184, 114990.

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3

Pastaria Festival 2024: here’s the programme

Editorial staff

The opening of the proceedings of Pastaria Festival 2023. From the left: Gherardo Bonetto (APPF), Paolo Barilla (Barilla G. e R. F.lli), Margherita Mastromauro (Unione Italiana Food), Lorenzo Pini (Pastaria), Carl Zuanelli (IPO, NPA), Fabio Fontaneto (APPAFRE)

With just a few weeks to go before the eighth Pastaria Festival gets underway, here is the programme of the event organised by our magazine that offers professional upgrading and information about pasta manufacturing, with the contribution of associations, universities and experts. For the first time spread over two days and for the first time in Florence (as part of Fiera Pastaria), the Pastaria Festival 2024 will be held on 20 and 21 May in the prestigious setting of Stazione Leopolda.

The Pastaria Festival 2024, the free event that offers pasta manufacturers professional upgrading and growth organised by Pastaria with the contribution of associations, universities, companies and experts, is about to get underway.
For its eighth edition, the Pastaria Festival will be held – for the first time – over two days, on 20 and 21 May, at Stazione Leopolda in Florence – also a first – as part of Fiera Pastaria, the brand new exhibition for suppliers of technologies, ingredients and services for pasta factories.
The spirit of sharing knowledge about the pasta production business, which inspires and characterises the Pastaria Festival (whose pay-off is *Sharing know-how on pasta manufacturing*), is expressed to its full in the extensive programme of conferences, round tables, presentations and meetings published in full here (the updated program is also available on www.fierapastaria.com).
The Pastaria Festival 2024 is an international event, accompanied by simultaneous translation in English.
All pasta manufacturers of any type and origin are invited to take part.

The Programme

Monday, 20 May

9:45-10:45 am | Pastaria Festival Area

Opening of the Pastaria Festival.
Gherardo Bonetto (APPF), Fabio Fontaneto (APPAFRE), Margherita Mastromauro (Unione Italiana Food), , Lorenzo Pini (Pastaria), Claudio Zanão (ABIMAPI), Carl Zuanelli (IPO, NPA).

11:00 am -12:45 pm | Pastaria Festival Area

Advanced technologies and services for pasta production
Renato Dall'Agata (Fava), *LPG 180 long pasta production technology*
Alessio Marchesani (Fava), *Fresh pasta: technologies and innovation*
Federico Martini (Fava), *IIOT applications to maximise overall equipment effectiveness (O.E.E.)*
Alessia Lolli (Fava), *Applied research services for product development and optimisation*.
Moderator: Michele Storci (Fava).
Fava conference, Main sponsor of the Pastaria Festival.

11:30 am - 12:30 pm | Eccellenza Pastaria Room

APPAFRE General Assembly
Participation reserved for member pasta factories.

1:00-1:30 pm | Pastaria Festival Area

Reflections on food safety: the role of lubricants and processing aids

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Speakers: Andrea Marotta (Klüber Lubrication), Federico Provenzani (Klüber Lubrication).
Klüber Lubrication Presentation.

1:45-3:30 pm | Pastaria Festival Area

An encounter of cultures in the world of pasta, organic and natural flavours: sustainable taste that conceals a memory
Virginia Tonanni (New Flavours), *Aromas in movement: understanding US and European labels. Different cultures and flavour trends. The new frontiers for successful pasta*
Veronica Pero (New Flavours), *Communicating business sustainability 'without lies', but by doing. Choices and consequences of greenwashing and greenblushing*
Gianni Sagratini (University of Camerino), Samanta Corsetti (University of Camerino), *Study and enhancement of bioactive compounds in natural aromas*
Salvatore Pizzo (DNV Assurance Italy), *The new frontiers of sustainability in food processing*
Federica Di Candia (Itineri), *Legù's experience puts peasant food back on the table*
Ciro Borrelli (4BMC), *The QR code: pasta and aromas, much more than a simple link.*
Moderator: Letizia Bellucci (New Flavours).
New Flavours conference.

2:00-4:00 pm | Eccellenza Pastaria Room

First national meeting of small top-quality pasta factories
Participation reserved for pasta producers who have joined the initiative.

3:00-4:15 pm | International Room

Union des Associations de Fabricants de Pâtes Alimentaires de l'U.E. (UNAFPA) General Assembly

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4:30-6:00 pm | International Room
International Pasta Organisation (IPO) General Assembly
Participation reserved for member pasta factories.

3:45-5:30 pm | Pastaria Festival Area
Fresh pasta and innovative ingredients
Alessio Cimini (University of Tuscia), *Use of malted legumes in the production of fresh pasta*
Vladimiro Cardenia (University of Turin), *New technological challenges to control cholesterol and its oxidation in tannins enriched egg pasta*
Valeria Imeneo (University of Milan), *Thermal treatment of legume flours used to make pasta*
Moderator: Cristina Alamprese (University of Milan).
Academic conference[1].

Tuesday, 21 May
9:45-11:30 am | Pastaria Festival Area
Vegetable proteins: sustainable approaches and emerging trends
Speakers: Matteo Angri (MartinoRossi), Francesco Barba (Barilla G. e R. F.lli), Alberto Cartasegna (Miscusi), Monica Maj (Catholic University of the Sacred Heart of Piacenza), Pier Luigi Rossi (University of Bologna).
MartinoRossi round table.

11:45 am - 12:45 pm | Pastaria Festival Area
Self-regulation code on voluntary claims used in pasta advertising.
A commitment of Unione Italiana Food pasta makers to make pasta claims increasingly transparent
Cristiano Laurenza (Secretary of Unione Italiana Food pasta makers), Emanuele Marconi (Bio-Medical Campus of the University of Rome, CREA – Food and Nutrition Research Centre, Rome), Margherita Mastromauro (President of Unione Italiana Food pasta makers).
Unione Italiana Food round table.

1:00-1:30 pm | Pastaria Festival Area
Microwave oven pasteurisation: product innovation and environmental sustainability in fresh pasta
Speaker: Simone Bertoncello (Head of Fresh Pasta Engineering di GEA).
GEA presentation.

1:45-2:45 pm | Pastaria Festival Area
Pasta and international markets: consumption and trends in the retail and food service channels
Serena Colacino (NielsenIQ), *Time goes by but you never go out of fashion*

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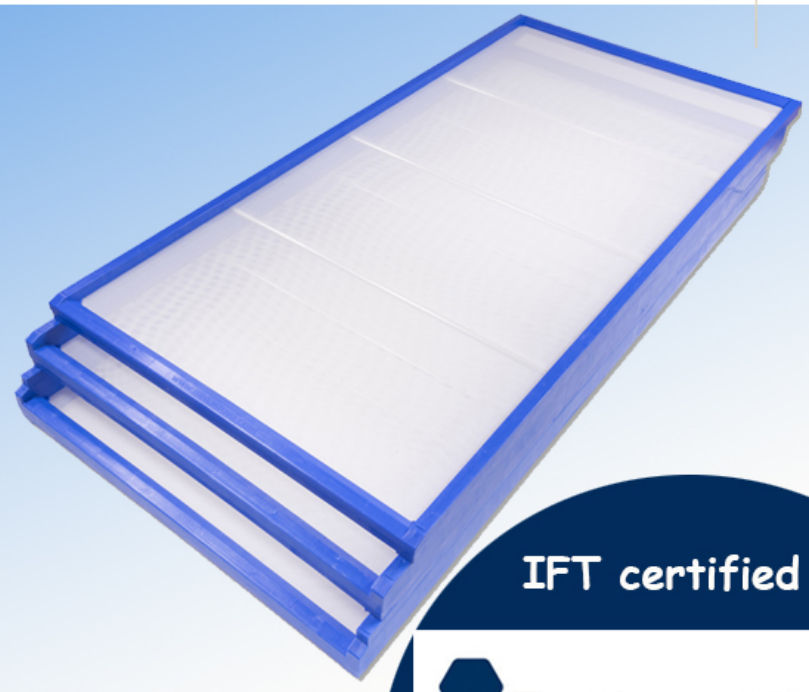

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Matteo Figura (Circana), *Away-from-home pasta consumption in Italy and Europe*.

3:00-5:30 pm | Pastaria Festival Area

Dry, traditional, gluten-free and wholemeal pasta: ingredients, quality and process optimisation

Alessandra Marti (University of Milan), *The quality of wholemeal pasta: from the raw material to the production process*

Pasquale Trematerra (Università of Molise), *Insect pests in pasta and some considerations on the packaging*

Emanuele Marconi (Bio-Medical Campus of the University of Rome, CREA – Food and Nutrition Research Centre, Rome), *Optimisation of pasta drying diagrams to limit the Maillard Reaction and lipid oxidation*

Lorenzo Estivi (University of Milan), *Bioaccessibility of antioxidant compounds in gluten-free pasta enriched with industrial by-products*

Riccardo Guidetti (University of Milan), *Sustainability in catering: the case of pasta cooking equipment*

Laura Gazza CREA – Agri-Food Engineering and Transformation Research Centre, Rome), *Parboiled Wholemeal Rice Pasta: innovative transformation processes for varieties with different amylose content*

Cinzia Montemurro (University of Bari), *Varietal characterisation of pasta using DNA markers.*

Moderator: Gabriella Pasini (University of Padua).

Academic conference[1].

Taking part

Attendance to the Pastaria Festival is free, by invitation only, and is reserved for pasta manufacturers, with mandatory registration, subject to availability.
Follow the procedure indicated on www.fierapastaria.com to register, taking care to choose Platinum entrance, the only one that allows you to enter the Pastaria Festival conference area.
All pasta makers are invited to take part and can enter the following invitation code (reserved for pasta makers), in the relative field:
BGKI9LHU
indicating ‘Pastaria’ as the company from which the invitation was received..
We recommend that you come to the Pastaria Festival only after you have received confirmation of registration.

The Steering Committee

The Pastaria Festival steering committee consists of a scientific committee with the following members: Cristina Alamprese (University of Milan), Luigi Cattivelli (CREA – Genomics and Bioinformatics Research Centre, Piacenza), Margherita Dall’Asta (Catholic University of the Sacred Heart of Piacenza, Gabriella Pasini (University of Padua), Emanuele Marconi (Bio-Medical Campus of the University of Rome, CREA – Food and Nutrition Research Centre, Rome), Francesca Scazzina (University of Parma), and an Advisory Committee with the following members: Armando Barozzi (De Cecco), Gherardo Bonetto (APPF). Roberto Ciati (Barilla), Cristiano Laurenza (Unione Italiana Food, International Pasta Organisation), Federico Marotta (Rana), Michele Minucciani (MassimoZero), Marco Loschi (Hilcona), Stefano Zardetto (Voltan Group). The Steering Committee is coordinated by Lorenzo Pini, editor-in-chief of Pastaria.

Notes

1. Topics and speakers drawn up by the Pastaria Festival Steering Committee.

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4

Development of gluten-free gnocchi with heat-treated pea flours

Valeria Imeneo, Carola Cappa, Cristina Alamprese
Department of Food, Environmental and Nutritional Sciences (DeFENS), University of Milan

The aim of this study was to evaluate the effects of two types of heat treatment on the technological properties of pea flour for the formulation of gluten-free gnocchi. The flour, which was heat-treated by extrusion, exhibited better technological properties than its untreated counterpart, and the gnocchi obtained from it showed characteristics consistent with high quality fresh pasta, such as, for example, a loss of solids during cooking of approx. 3%. Additionally, the texture of the extruded pea flour gnocchi was comparable to that of the traditional, gluten-free gnocchi used as a control.

Introduction

Growing consumer demand for gluten-free food products is generating more and more interest in alternative sources of naturally gluten-free flour. In recent years, in particular, attention has focused on the use of legume flour as the main ingredient in the formulation of new foods, such as bakery products and pasta. The interest in this category of flour is attributable to its nutritional profile, which can validly counteract the nutrient deficiencies commonly found in gluten-free bakery products and pasta, given that legume flour is a valuable source of protein, dietary fibre, vitamins, minerals and complex carbohydrates, which have a positive impact on human health (Foschia et al., 2017).

At the same time, when formulating a food, it is always crucial to consider the importance of the technological properties of the raw materials used. In the case of gluten-free pasta, for example, there may be difficulties with the final structure and texture of the product, since the gluten network with its typically structuring effect, is not formed, as it is in wheat-based pasta. In this regard, while being suitable for the production of gluten-free pasta thanks to its rheological properties, legume flour needs to be used in conjunction with hydrocolloids in order to guarantee a firm and elastic consistency to the final product (Naqash et al., 2017; Torres Vargas et al., 2021). To remedy this shortcoming, subjecting legume flour to heat treatment can improve its technological properties, such as its solubility and capacity to bind water and oil: the successful use of such flour in the formulation of pasta with a suitable structure and texture can be attributed to these factors (Pasqualone et al., 2021; Foschia et al., 2017).

In this light, the aim of this study was to evaluate the effect of two different heat treatments (extrusion and turbo-cooking) on the technological characteristics of pea flour. Subsequently, following a formulation optimisation study, the extruded flour was used for the production of fresh pasta, specifically gnocchi, evaluating the quality characteristics of the finished product, both raw and cooked.

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The idea of focusing on the formulation of fresh pasta stems from the fact that it is one of the most popular and most highly appreciated foods in the world. Furthermore, as there are currently no gnocchi on the market formulated solely with legume flour, this study made it possible to develop an ideal product to meet the growing consumer demand for gluten-free food with good nutritional properties.

Materials and methods

To start with, three different pea flour samples were characterised: as is (P_TQ) and heat-treated using two different technologies, i.e. extrusion-cooking (P_EC) and turbo-cooking (P_TC). Extrusion is a widely applied technology for producing ready meals and it is also used to obtain pregelatinised flour. This processing technology is distinguished by high productivity, low operating costs, high energy efficiency and short processing times (Ganjyal, 2020). The treatment of flour by extrusion improves its quality through multiple biochemical and nutritional effects, such as starch gelatinisation, protein denaturation, increase in soluble dietary fibre and reduction of anti-nutritional compounds, such as trypsin inhibitors, phytic acid and tannins, which are known to negatively affect the digestibility of legumes (Morales et al., 2015; Ciudad-Mulero et al., 2020). A more recent heat treatment technology patented by Vomm® Impianti e Processi S.p.A. (Rozzano, Milan) is, on the other hand, turbo-cooking, the operating principle of which consists of the creation of a thin layer of material, in strong turbulence, that adheres to the inner wall of an appropriately heated cylindrical surface, thereby guaranteeing that a uniform temperature is rapidly reached during processing. This technology can be used to pre-cook various types of flour in order to modify their technological properties and/or to reduce microbial contamination (Vezzani, & Foti, 1989; Cappa et al., 2017).

The characterisation of pea flour samples involved the evaluation of particle size (Mastersizer 3000, Malvern Panalytical, Cambridge, UK), the amount of damaged starch (using the specific kit provided by Megazyme International Ireland Ltd., Bray, Wicklow, Ireland), the degree of solubility in cold water (Singh & Singh, 2003), the water retention capacity (WRC) as described by Cappa et al. (2018), the oil absorption capacity (OAC) as reported by Turan et al. (2015) and the visco-amylographic properties (Tuna et al., 2023).

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Next, to optimise the formulation of the gnocchi, an experimental design was set up considering as factors the flour treatment technology and the amount of water used to produce the dough (range 110-180% of the flour weight). The 12 dough samples resulting from the experimental design were characterised in terms of texture and workability, thanks to which an optimised formulation for pea gnocchi could then be calculated. The optimised sample (GN_P) was produced on an artisanal scale, using a machine to give the dough the shape typical of gnocchi. The quality characteristics of the optimised pea gnocchi were compared to those of gnocchi made from commercial gnocchi preparations (GN_STD) – containing potato flakes and starch, and soft wheat flour – and gluten-free gnocchi (GN_GF), containing corn starch, potato flakes and starch, and rice flour. The control gnocchi were prepared using the amount of water recommended on the label, i.e. 131.7% and 120% of the weight of the preparation for GN_STD and GN_GF, respectively. The quality characteristics considered were the colour on the CIE L*a*b* scale, behaviour during cooking, expressed in terms of weight gain and solid residue released in the cooking water, and the texture of the cooked gnocchi, determined by compression, shear and extrusion tests (Kramer cell) according to Cappa et al. (2021). Cooking was carried out under standard conditions for all samples, cooking the gnocchi with a sample:mineral water weight ratio of 1:10, without adding salt. Cooking was continued for 1 min and the pasta was then drained and left to cool for 20 min inside a hermetically-sealed container before being tested.

The analytical data obtained were subjected to statistical analysis (one-way analysis of variance, followed by the least significant difference test; $p < 0.05$) in order to highlight significant differences between the various types of pea flours and between the pea gnocchi and the controls.

Results and discussion

Tabele 1 hows the results of the technological properties of the analysed pea flours. All pea flours were found to have a larger grain size than the wheat flour usually used for the production of fresh pasta, which is generally of a D_{90} value ranging from 110 to 184 µm. Among the heat-treated flours, P_EC was characterised by a finer grain size, with a D_{90} value of 416.3 µm, mainly attributable to the milling procedure adopted. This aspect, together with the partial

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Table 1 MAIN TECHNOLOGICAL CHARACTERISTICS OF PEA FLOUR AS IS (P_TQ) AND PEA FLOUR HEAT-TREATED BY EXTRUSION-COOKING (P_EC) AND BY TURBO-COOKING (P_TC)

	Grain size (μm)			Damaged starch (%)	Solubility (%)	WRC (%)	OAC (mL/g)
	D_{10}	D_{50}	D_{90}				
P_TQ	17.1 ± 0.2[a]	168.3 ± 2.3[b]	366.7 ± 2.3[a]	2.0 ± 0.1[a]	28.0 ± 1.1[b]	104 ± 4[a]	1.01 ± 0.01[a]
P_EC	28.1 ± 0.3[c]	121.7 ± 0.6[a]	416.3 ± 4.6[b]	37.9 ± 2.4[c]	40.2 ± 0.9[c]	345 ± 5[c]	1.58 ± 0.06[c]
P_TC	26.9 ± 0.3[b]	282.0 ± 3.0[c]	682.0 ± 3.6[c]	8.9 ± 0.2[b]	24.0 ± 1.2[a]	145 ± 4[b]	1.13 ± 0.03[b]

a-c, a different letters in the same column indicate significantly different mean values.
D_{10}, D_{50}, D_{90}, respectively 10%, 50%, 90% of the particles in the flour with sizes smaller than the indicated value; WRC, water retention capacity; OAC, oil absorption capacity.

gelatinisation of the starch granules triggered by the heat treatment, also affected the degree of starch damage. In fact, P_EC showed a higher level of damaged starch, suggesting that the milling procedure adopted and the extrusion-cooking treatment may have had a greater impact on the technological properties of the flour. The P_EC sample also showed a higher degree of solubility in water, an aspect that can be attributed to the lower grain size and higher degree of starch damage in addition to possible changes in the protein structure, following the application of the heat treatment. Confirming this, the heat-treated flour showed a significant improvement also in terms of water retention capacity (WRC), again linked to the partial protein denaturation and gelatinisation of the starch granules. The highest WRC values were, in fact, found in the P_EC sample, which had the finest grain size and the highest level of starch damage. Significant variations following heat treatment were also found in the oil absorption capacity (OAC) of the flour, an important characteristic in food formulations, since ingredients with high OAC values promote greater appreciation of the sensory attributes of the food (Turan et al., 2015). The oil absorption capacity of flour can be influenced by particle size, starch and protein content, and type of protein: the more hydrophobic the proteins, the easier they bind with the lipids (Kinsella, 1979). A further relevant factor in the characterisation of a flour is the visco-amylographic properties, which are affected by the degree of gelatinisation and dissolution of the starch, and are determined by assessing the change in

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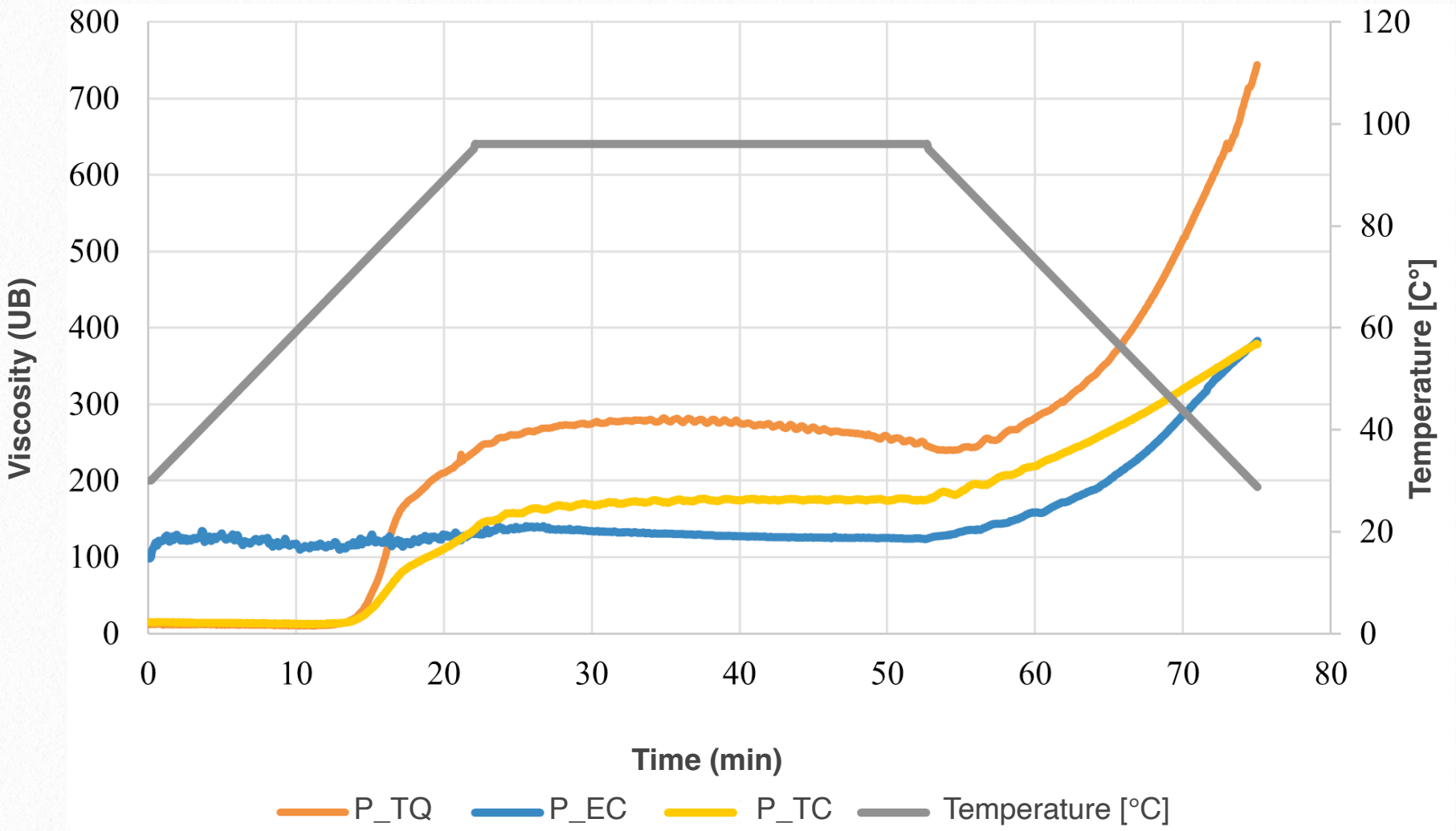
Figure 1 VISCO-AMYLOGRAPHIC CURVES OF PEA FLOUR AS IS (P_TQ) AND PEA FLOUR HEAT-TREATED BY EXTRUSION (P_EC) AND BY TURBO-COOKING (P_TC)



viscosity of the flour:water suspension over time, on variation of the temperature. As shown in Figure 1, the pea flour samples were characterised by a very low initial viscosity, with the exception of sample P_EC, which presented a higher initial viscosity value (approx. 100 Brabender Units, UB), in accordance with the higher degree of solubility and damaged starch in the flour (Table 1). The low initial viscosity value of the P_TC sample could indicate that the heat treatment carried out did not cause major destructuring of the starch granules, as already highlighted by the low damaged starch content detected in the flour (Table 1). During the visco-amylographic test, as the temperature increased, there was a progressive increase in the viscosity of the suspension of the P_TQ and P_TC samples, a phenomenon due to the swelling of the starch granules until they totally ruptured, allowing the amylose to leach out. This was not the case for sample P_EC, further confirming that the starch granules had already been





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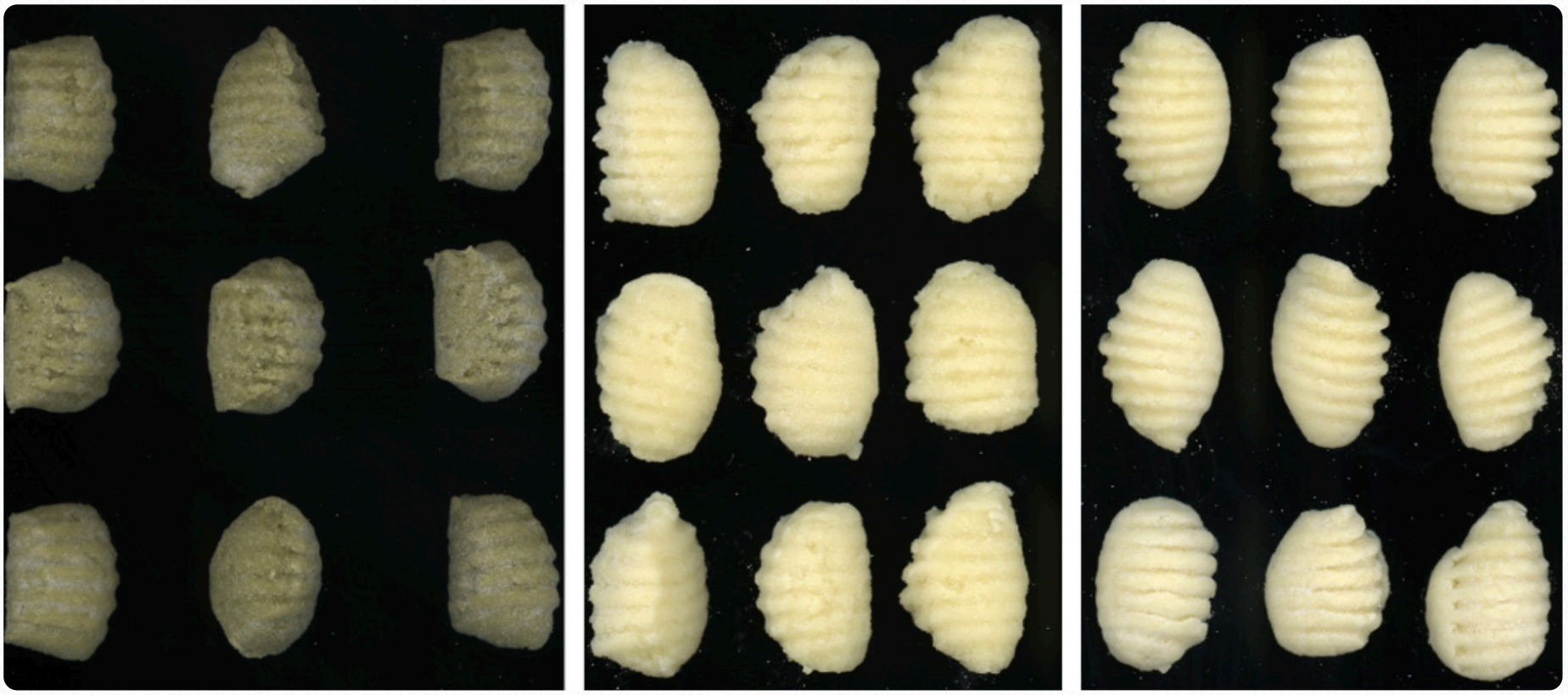
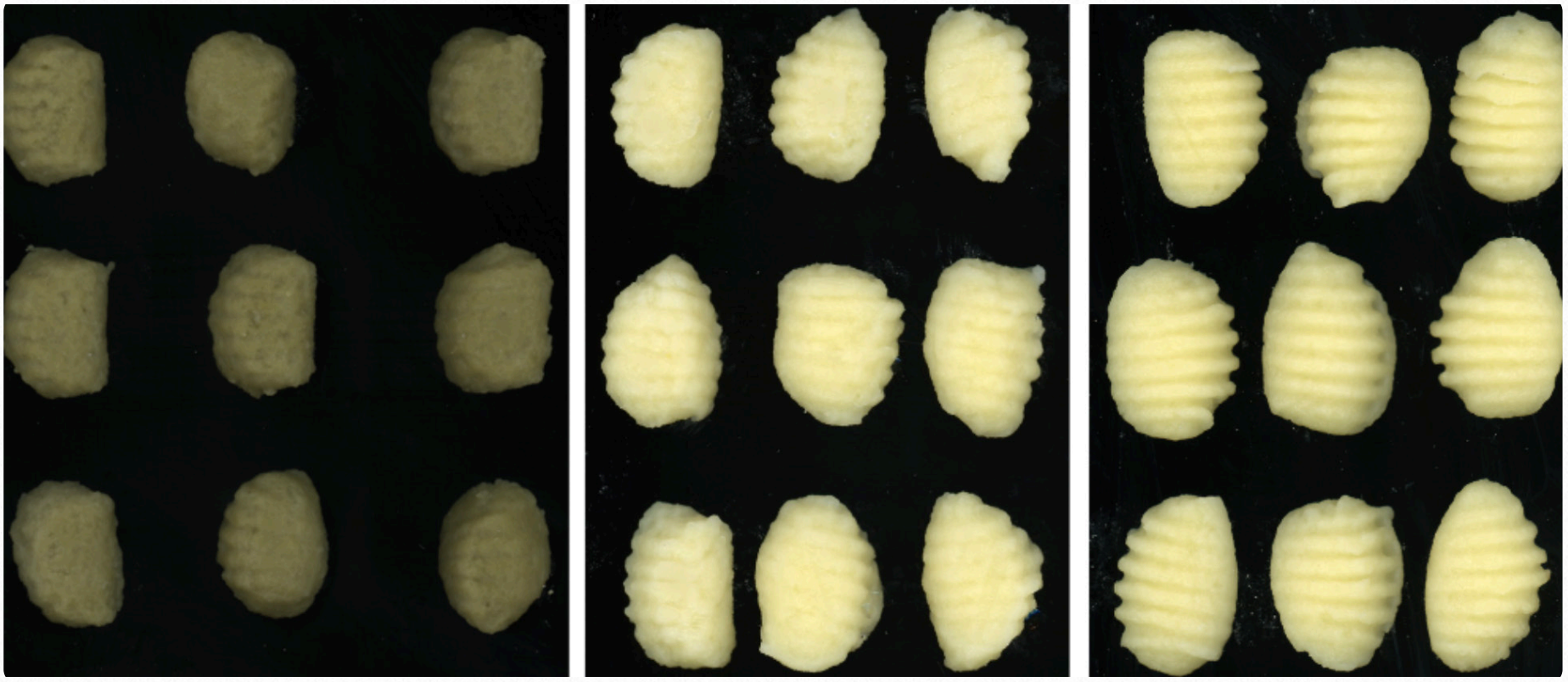
Figure 2 **IMAGE OF RAW GNOCCHI SAMPLES MADE WITH EXTRUDED PEA FLOUR (GN_P, LEFT), WITH COMMERCIAL PREPARATION CONTAINING POTATO FLAKES AND STARCH, AND SOFT WHEAT FLOUR (GN_STD, CENTRE) AND WITH COMMERCIAL PREPARATION CONTAINING POTATO FLAKES AND STARCH, AND OTHER GLUTEN-FREE INGREDIENTS (GN_GF, RIGHT)**



destructured during the extrusion-cooking treatment. During the subsequent cooling phase, an increase in viscosity was observed due to the reorganisation of amylose and amylopectin within the starch granule and to the formation of a network involving the protein and fibre components in the matrix. The heat-treated pea flours showed lower final viscosity values than the as is sample, inasmuch as the starch granules had already been gelatinised and retrograded following the heat treatment. Given the better technological properties exhibited by the heat-treated flours, more suitable for the shaping and cooking of gluten-free fresh pasta, the P_EC and P_TC samples were taken into consideration for the purposes of the experimental design, and the amount of water added was varied, in a range from 110 to 180% of the flour weight. The application of the experimental design made it possible to optimise the formulation of pea gnocchi on the basis of the texture and machinability of the dough. From the elaboration of the experimental design, it emerged that the best formulation was that of the pea flour subjected to heat treatment by extrusion (P_EC) and the addition of 148.5% water; with this formulation, the gnocchi (GN_P)

Figure 3 **IMAGE OF COOKED GNOCCHI SAMPLES MADE WITH EXTRUDED PEA FLOUR (GN_P, LEFT), WITH COMMERCIAL PREPARATION CONTAINING POTATO FLAKES AND STARCH, AND SOFT WHEAT FLOUR (GN_STD, CENTRE) AND WITH COMMERCIAL PREPARATION CONTAINING POTATO FLAKES AND STARCH, AND OTHER GLUTEN-FREE INGREDIENTS (GN_GF, RIGHT).**



used in the next phase of the experiment were produced.

As shown in Figure 2, the optimised gnocchi (GN_P) were well-shaped and characterised by their typical surface grooves, as were the control gnocchi containing gluten (GN_STD) and gluten-free (GN_GF), confirming that the formulation and process conditions adopted (e.g. during the kneading and shaping phase) are the right ones for obtaining the desired product.

Even after cooking, all the gnocchi samples maintained the characteristic shape and grooves of this type of fresh pasta, without excessive disintegration of the product (Figure 3).

Table 2 sshows the results relating to the characterisation of the cooked gnocchi samples. As expected, the colour analysis showed a significant difference between the gnocchi containing extruded pea flour and the gnocchi used as controls, due to the different type of flour used. The colour of the legume gnocchi reflects the colour coordinates of the flour used to make them, confirming that the pea flour retains its characteristic colour even after cooking.

Significant differences between the various gnocchi samples were also found in terms of weight gain after cooking: the legume

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Table 2 **MAIN QUALITY CHARACTERISTICS OF THE COOKED GNOCCHI PRODUCED WITH EXTRUDED PEA FLOUR (GN_P), WITH COMMERCIAL PREPARATION CONTAINING POTATO FLAKES AND STARCH, AND SOFT WHEAT FLOUR (GN_STD) AND WITH COMMERCIAL PREPARATION CONTAINING POTATO FLAKES AND STARCH, AND OTHER GLUTEN-FREE INGREDIENTS (GN_GF).**

	Colour			Weight gain during cooking (%)	Loss of solids during cooking	Texture (N)
	L*	a*	b*			
GN_P	58.6 ± 1.5^{a}	-10.4 ± 0.2^{a}	27.8 ± 1.1^{b}	2.2 ± 0.5^{a}	3.1 ± 0.4^{c}	126 ± 7^{a}
GN_STD	75.9 ± 0.7^{b}	-7.8 ± 0.5^{b}	20.7 ± 1.6^{a}	10.9 ± 1.2^{c}	2.6 ± 0.2^{b}	130 ± 7^{a}
GN_GF	75.7 ± 1.7^{b}	-7.9 ± 0.4^{b}	20.3 ± 1.5^{a}	6.7 ± 0.9^{b}	1.3 ± 0.2^{a}	216 ± 19^{b}

a-c, a different letters in the same column indicate significantly different mean values

gnocchi showed the lowest value, indicating lower water absorption for the same cooking time. Also contributing to lower weight gain when cooking pea gnocchi was the higher loss of solids during cooking (approx. 3 %), which is nevertheless considered acceptable for good quality fresh pasta (Cappa et al., 2021). Generally speaking, higher loss of solids during cooking is a typical aspect of gluten-free fresh pasta, precisely because of the absence of the gluten network. In the case of the gluten-free control gnocchi (GN_GF), the lower loss of solids during cooking could be due to the fact that thickeners were added to the formulation of the preparation used.

A key aspect for good consumer acceptance is the texture of the gnocchi after cooking. The pea flour gnocchi obtained under the optimised conditions presented a texture comparable to that of the control gnocchi containing gluten (GN_STD) and significantly inferior to that of the gluten-free gnocchi obtained from the commercial preparation (GN_GF). This behaviour makes it possible to affirm that the use of extruded pea flour, characterised by good technological properties and an appropriate amount of water, has made it possible to obtain a legume-based product similar to that containing potato flakes and starch, and wheat flour.

Conclusions

In conclusion, this study has demonstrated that it is possible to improve the technological properties of pea flour by subjecting it to heat treatment, in order to enable it to be applied more effectively in

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the production of gluten-free fresh pasta. Gnocchi with extruded pea flour emerged as an excellent alternative to traditional potato-based gnocchi, with or without gluten. They were characterised by an appearance (shape and surface grooves) similar to that of traditional gnocchi, and by the characteristic colour attributable to pea flour, both raw and cooked. Even after cooking, the gnocchi made from pea flour had a low loss of solids during cooking and a similar texture to gnocchi containing potato flakes and starch, and wheat flour. The production of gnocchi with legume flour would, therefore, provide the consumer with an alternative product to traditional gluten-free fresh pasta, characterised by good quality and better nutritional properties.

Acknowledgements

This study was conducted as part of the project entitled LOCALNUTLEG (Developing innovative plant-based added-value food products through the promotion of LOCAL Mediterranean NUT and LEGUME crops) funded by PRIMA

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Considering the uncertainty that characterises current international relations, it is difficult to predict what direction energy commodity prices will take in the coming months, primarily oil which is able (potentially) to trigger a domino effect on other commodities, including agricultural and food ones.

Let us take a closer look at the situation within the framework of relations in the Middle East, an area that is becoming increasingly critical with the recent involvement of Iran. There are two different forecasts of possible crude oil price scenarios. There is the downward revision, now dominant, of the International Energy Agency (IEA), which on 12 April cut its growth estimate for oil demand from 1.3 million barrels per day to 1.2 million in 2024, and declining to 1.1 million in 2025. And, instead, there is the upward revision, considered less credible, proposed by OPEC, the Organisation of the Petroleum Exporting Countries, which, instead, mainly points to the growth in supply that has been recently quota-restricted with agreed cuts.

The first outlook, that of the IEA, is motivated by the prospect (confirmed by the International Monetary Fund) of a weakening of the global macroeconomic framework in the 2024-2025 period and by an increasing introduction into the market of electric vehicles, especially of Chinese make, both factors with a potentially negative effect on global oil demand. On the contrary, OPEC predicts a robust demand for both this year and the following twelve months. In its monthly report, it maintained its global demand growth forecast at 2.2 million barrels per day in 2024 and 1.8 million in 2025, while at the same time revising downward the dynamics of non-OPEC production. Even although last year's strong growth in crude oil production from the US and other non-cartel countries offset the production cuts decided by OPEC+, the club that also includes Russia and other non-member countries.

It is clear that geopolitical developments in the Middle East and the outcome of the war in Ukraine, in a scenario of growing tension, could lead to new shocks and supply disruptions, which would push crude prices up again. However, conditions appear to confirm a future

PRICES AND TRENDS OF CERTAIN FOOD RAW MATERIALS (MARCH 2024)				
National fine common wheat	Price (€/ton)	Monthly variation	Annual variation	Forecast
	217.25	-6,5%	-25,1%	▼
Fine durum wheat from North Italy	Price (€/ton)	Monthly variation	Annual variation	Forecast
	316.25	-12%	-20%	▼
00 type common wheat flour	Price (€/ton)	Monthly variation	Annual variation	Forecast
	552.5	-3.1%	-15.1%	▼
Semolina above min. leg. req.	Price (€/ton)	Monthly variation	Annual variation	Forecast
	641.25	-7.1%	-11.9%	▼
Eggs M	Price (€/100 pcs)	Monthly variation	Annual variation	Forecast
	16.9	0.6%	-13.3%	▼
Pork hams for Prosciutto 12 kg and over	Price (€/kg)	Monthly variation	Annual variation	Forecast
	4.82	-0.4%	-5.5%	=
Beef – veal meat half-carcass, prime quality	Price (€/kg)	Monthly variation	Annual variation	Forecast
	7.02	0.1%	2.2%	=
Raw milk	Price (€/100 kg)	Monthly variation	Annual variation	Forecast
	44.81	-3.6%	-4.4%	▼
Centrifuged butter	Price (€/kg)	Monthly variation	Annual variation	Forecast
	5.87	6.3%	22.8%	▲
Grana Padano aged for 9 months or more	Price (€/kg)	Monthly variation	Annual variation	Forecast
	9.19	2.6%	0.7%	=
Extra virgin olive oil	Price (€/kg)	Monthly variation	Annual variation	Forecast
	9.8	0%	58.1%	=

Source: Centro Studi Economici Pastaria elaboration based on various data sources. Grain, flours and semolina: Granaria, Bologna; Eggs: CCIAA, Forlì; Pork and beef: Commodity Exchange, Modena; Milk, butter and Grana Padano: Commodity Market, Milan; Olive oil: CCIAA, Bari.

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FAO Food Price Index	Price (2014-2016=100)	Monthly variation	Annual variation	Forecast
	118.3	1.1%	-7.8%	▼
Hard Red Winter US Gulf port	Price (USD/ton)	Monthly variation	Annual variation	Forecast
	274.83	-1.3%	-25.7%	▼
Mais, U.S. No. 2 Yellow FOB US Gulf port	Price (USD/ton)	Monthly variation	Annual variation	Forecast
	190.57	0.8%	-32.5%	▼

Fao Food Price Index, Hard Red Winter, Mais: March 2024

stabilisation or downward revision of the prices of both Brent and Wti (European and American benchmarks, respectively), forecasts that confirm bearish scenarios, in the absence of exogenous factors, also for agricultural commodities, even more so in light of the current prices of staples.

In recent days, the International Grains Council (IGC) has slightly revised downwards its projections for the 2024/25 world cereal harvest, but confirmed its expectation of a new historical record of 2.32 billion tonnes, albeit in anticipation of a higher demand than in 2023/24. Corn and soybean harvests will set a new record, forecast at 1.23 billion and 413 million tonnes respectively. Instead, global grain production is expected to surge to 798 million, recovering the ground lost in 2023/24, but without touching a new all-time high, which remains the over 800 million tonnes reached in 2022/23.

Meanwhile, on the markets, the pressure of Russian grain helped to keep prices in check, in many cases also winning out over European supplies, especially in public tenders in Turkey and Tunisia.

The scenarios in international markets thus remain clearly bearish for cereals and oilseeds, given the global supply conditions, although in aggregate, prices remain high compared to pre-pandemic levels. Soybeans, which affect feed costs, impacting breeders' costs and the prices of related products (meat and milk), have regained some momentum supported by non-food demand from refineries in the US and Brazil for biofuel production.

In any case, for the entire agricultural and food sector, the World Bank's forecasts are bearish both for this year and the following twelve months. There may also be a respite in tensions regarding products that have been most impacted by supply

shocks, such as rice and olive oils. For the former, prices are now realigning with historical trends, within the framework of a sharp reduction in final consumption due to maxi price rises on the shelves. Instead, for olive oils, the mechanisms to mitigate price pressures at the various trading stages have not yet had an effect, although the conditions seem to prelude a possible attenuation of tensions with the more favourable climatic and production conditions, especially in Spain, where the results have been far below potential for two years in a row.

Moreover, a better year is forecast that will only have tangible effects on olive oil prices from next autumn. Tensions are likely to continue for another six months also in view of the still greatly reduced stocks in the hands of producers and all trade operators.

The dairy market was more volatile with some supply shortages emerging, due to low butter stocks in Europe, as well as tensions on the cost structure of livestock farms that are gradually easing however thanks mainly to the feed component, linked to trends of cereal and soybean prices.

There is still pressure on meat prices within the context of the health emergencies in the poultry and pig sectors, while sugar, another key commodity for the agri-food sector, experienced a retracing, following a strong start to the year, with a view to a better balance between stocks, production and consumption and a supply deficit that is significantly lower than initially estimated.

Looking ahead, no situations of pressure emerge other than possible spillover effects from energy commodities. The devaluation of the euro in the cross with the US dollar, a factor that may affect commodity prices, is worthy of note. Balances, currency ones, which will be further adjusted in anticipation of a first cut in the ECB's reference rates (perhaps as early as June), but in the absence of similar easing measures by the US Federal Reserve.

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6

Making pasta against autism

Maria Antonietta Dessi

Giuseppe La Riccia

Giuseppe La Riccia, an expert pasta maker, has launched an inclusivity project to set up a pasta making workshop where young autistic people can learn the trade and enter the labour market. A crowdfunding campaign has been launched to support the project promoted by the PastAut association.

Pasta is not just food, it is not just a way of feeding the body. In Italy it is also culture, identity, history, economy. And today, this extraordinary product that takes pride of place on most tables in the Bel Paese at least once every day has a social role too.
The first inclusive vocational training school for pasta makers has been set up in Calabria, with the whole of southern Italy as its catchment area and with the noble and ambitious aim of supporting young people with an autism spectrum disorder to learn a trade and enter the labour market.
Pasta-making is an art that offers young people suffering from the distress of the isolation and obstacles caused by this condition a means for inclusion. The project will be developed and coordinated by the PastAut ETS Association and will involve setting up a workshop for the production of high quality fresh and dry pasta, and will not only be a place to teach skills, but also, in time, a means for many young people to gain personal and financial independence. A way of overcoming their limits and prosper both professionally, and in their everyday life. For people with an autism spectrum disorder, even the most elemental everyday activity can become an insurmountable obstacle. And one of the project's aims is to help these people gain the determination and ability to overcome problems, even the smallest ones, every day.
PastAutETS is the brainchild of Giuseppe La Riccia, a pasta maker with over 35 years of experience.
From direct experience in his own family, La Riccia, facing the problem as a grandfather, knows just how difficult autism can be, not only for those directly affected, but also for the people around them. This increasingly widespread pathology is a harrowing one for those people who, every day, have to deal with difficulties of all kinds and an isolation that distances them from the rest of the world.
On the strength of his experience in the field as a pasta maker, La Riccia is convinced that pasta can become a valuable tool to help young autistic people. Even more so for those who, once adults, although not independent and not yet able to build a future for themselves, lose any kind of aid from the government and institutions. And the law says that they lose it even though they still badly need it.
The school will be headquartered in a building in Cosenza already handed over by the Calabria Regional Authorities. The pasta-making workshop will be set up in this space where the young people involved will be given the chance to learn the trade. The project includes specific

courses on production techniques for teenagers between 16 and 18 years of age, while younger children can take part in the frequently organised open days when they will be offered sensory experiences to get to know the subject better. The activities will be coordinated by the PastAut ETS Association, which will also put families in contact with pasta professionals, as well as other professionals such as speech therapists, psychologists and educators. Valuable figures in this situation. The association also aims to become a point of reference that families and young people can turn to for support in the broadest sense and learn about other methods applied in the rest of the world, where experience in the field is greater, to offer some respite to those suffering from autism. Sharing experiences is fundamental, above all to help those who, for economic, logistical or cultural reasons, would not have the means to obtain specific information.
This project follows in the footsteps of similar ones already successfully set up in other production sectors in Northern Italy, and will involve the artisan pasta sector in Southern Italy, where resources for the emancipation and care for those suffering from autism are currently very limited.
A project that is therefore not only noble, but also ambitious and in need of support. Support that anyone can provide, even at a distance, and that - we are confident - the generous world of pasta will not want to withhold.
The association needs everything and every gesture helps, but above all it needs funds, production lines and fixtures and fittings on which the young people can try their hand and learn the trade. This is why we are making a heartfelt appeal to pasta makers, but above all to manufacturers of machinery and equipment, with a proposal to join the project directly, making a contribution to or donating machinery, including used equipment, which is invaluable for the full set-up of an experimental workshop.
More information and contact details are available on the official website: www.pastautets.it, where you can also find details on the crowdfunding campaign set up to receive donations.

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