NICCOLÒ RENOLDI

Education

September 2018 – January 2022	Ph.D. in "Food and Human Health", University of Udine, Udine, Italy. Dissertation title: "Development of functional and innovative cereal-based foods with reduced glycaemic response". Final mark: Ph.D. title cum laude. Supervisor: Prof. Donatella Peressini.
October 2015 – December 2017	Master's degree in "Food Science and Technology", University of Udine, Udine, Italy. Thesis title: "Application of a low-intensity ultrasonic technique to evaluate structural characteristics of fresh pasta enriched with dietary fibre". Final mark: 110/110 cum laude. Supervisor: Prof. Donatella Peressini. Co-supervisor: Prof. Martin Scanlon.
October 2011 – April 2015	Bachelor's degree in "Food Science and Technology", University of Udine, Udine, Italy. Thesis title: "Effects of lipid matrix on the monoglycerides organogel structure". Supervisors: Prof. Maria Cristina Nicoli, Prof. Sonia Calligaris.

Work experiences

December 2022 – now	Postdoctoral researcher at the University of Udine. Project consistent with the priorities of the National Research Programme 2021-2027 (PNR 2021-2027) and functional to present a project proposal under the HE - MSCA-PF-GF - call 2023 – action. Life Sciences Field. Supervisor: Prof. Nadia Innocente.
July 2022 – December 2022	Postdoctoral researcher at the University of Udine. Project title "Improvement of quality and sustainability in the production chain of semi-hard Italian cheeses". Supervisor: Prof. Nadia Innocente.
February 2022 – June 2022	Research fellow at the University of Udine. Project title "Development of a sensory analysis panel for Montasio cheese". Supervisor: Prof. Nadia Innocente.
November 2019 – October 2021	Student advisor for the bachelor's and master's degree course in Food Science and Technology at the University of Udine.
March 2018 – October 2018	Quality control manager at Dolce Milano Srl (baked products), Milano, Italy.

Post-degree training course

November 2019	Course in "Nutrient delivery and Impact on Human Health", University of Udine & CISM, Udine, Italy.
May 2019	Course in "Food shelf life: challenges, pitfalls and innovation", University of Udine & CISM, Udine, Italy.
February 2019	Master course in: "Dry Pasta Processing", Pavan SpA Group, Padova, Italy.

Other qualifications

- Auditor/Lead auditor for quality management systems ISO 9001 (qualified KHC).
- ISO 22000 internal food safety auditor (certified NSF Italy).
- IFS and BRC internal auditor (certified NSF Italy).

Research activity

Postdoctoral research (University of Udine, Udine, Italy)	Part I - Panel formation for sensory testing of semi-hard Montasio cheese. Panelists were recruited, selected, and trained according to ISO standards. Sensory profiles of fresh, medium, and mature Montasio PDO cheese were defined by trained judges. Part II - Identification of integrated solutions to innovate the semi-hard cheese production chain improving sustainability. Innovation was targeted by reducing cheese defects and valorising the biodiversity and microbial ecosystem of raw milk; and extending the shelf-life of cheeses portioned and packaged with low environmental impact materials.
Ph.D. course (University of Udine, Udine, Italy)	Investigation of innovative strategies to decrease the glycaemic index of cereal-based foods. Four starchy products (extruded snacks, pasta, bread, cake) characterized by different glycaemic responses were studied to highlight how the production process and the final product structure influence starch digestibility. This research primarily focused the attention on the relationship between rheological properties, microstructure, and in vitro digestion of the food. Strategies to alter the glycaemic response of products were obtained by adopting different technological approaches, related to common (cooking-extrusion) and alternative (high-pressure homogenization) processing and formulation interventions (addition of rice bran, psyllium fibre, oleuropein and chia concentrates).
Master's internship (University of Manitoba, Winnipeg, Canada)	An ultrasonic technique and traditional rheological techniques were used to evaluate the structural properties of fresh pasta to understand whether the ultrasonic tool can predict the mechanical structure of pasta dough. Ten samples were prepared with different supplementations of dietary fibres at different process conditions. A non-contact low-intensity ultrasound method was used to evaluate phase velocity and attenuation coefficient through pasta dough. Dynamic, creep and relaxation tests were performed to evaluate viscoelastic properties of pasta, followed by cooking quality tests.
Bachelor's internship (University of Udine, Udine, Italy)	Study of the effects of lipid matrix on the organogel structure formed by saturated monoglycerides. Evaluations were conducted through rheological properties, thermal properties (differential scanning calorimetry), and microscopy.

Scientific competences

- Practical laboratory skills.
- Use of pilot plants (extruder and high-pressure homogenizer).
- Use of equipment for physicochemical characterization of food (optical and confocal microscopes, particle sizer, farinograph, rheometer, calorimeter, texture analyser, colourimeter, HPLC system, GC-MS system, spectrophotometer, fluorimeter, FT-IR).
- Use of statistical programs (Origin, Statistica and R) for data modelling and statistical analysis of data (ANOVA, t-test, Bartlett, Tukey).
- Knowledge of quality management systems (ISO 9001:2008, ISO 22000:2005, BRC, IFS).
- Activity as reviewer for scientific peer-reviewed international journals (Food Structure, International Journal of Food Science and Technology, Food Research International).

Teaching and tutoring activities

June 2020 – September 2021

Exam committee member (AGR/15) for the subjects:
- Operazioni unitarie (bachelor's degree);
- Tecnologia dei prodotti di origine vegetale (bachelor's degree);
- Analisi sensoriale (bachelor's degree);
- Tecnologia dei prodotti di origine animale (bachelor's degree);
- Tecnologia lattiero casearia (bachelor's degree);
- Tecnologia della pasta e dei prodotti da forno (bachelor's degree);
- Tecnologia degli oli e dei grassi (bachelor's degree);
- Proprietà chimiche e fisiche degli alimenti (bachelor's degree);
- Mechanical properties of food products (master's degree);
- Food structure and physical properties (master's degree);
- Tecnologie alimentari I (master's degree);
- Principi di formulazione (master's degree);
- Quality system development and management and shelf-life assessment of foods (master's degree).

March 2022 – now

Laboratory activities for students at the University of Udine.
- "Analisi sensoriale degli alimenti" (bachelor's degree in "Science and Culture of Food", "Valutazione sensoriale degli alimenti" course, Prof. Nadia Innocente).

January 2019 – now

Laboratory and Thesis co-supervisor of Bachelor and Master students of the course in Food Science and Technology at the University of Udine.

<u>Bachelor Students in Food Science and Technology (L26):</u>
- Student: Davide Bongiorno, 08/2022 – 12/2022, Thesis title: "Evoluzione del profilo aromatico durante la conservazione del formaggio Montasio DOP porzionato e confezionato". Supervisor: Prof. Nadia Innocente.
- Student: Francesco Mella, 08/2022 – 12/2022, Thesis title: "Influenza delle modalità di confezionamento sulle caratteristiche del formaggio Montasio porzionato". Supervisor: Prof. Nadia Innocente.
- Student: Valeria Del Bianco, 03/2022 – 07/2022, Thesis title: "Valutazione della composizione chimica e del profilo aromatico di lattoinnesti utilizzati per la produzione di formaggi a pasta semidura". Supervisor: Prof. Nadia Innocente.

- Student: Francesco Pagotto, 03/2022 – 06/2022, Thesis title: "Messa a punto di un panel per la creazione dei profili sensoriali di formaggio Montasio a diverse stagionature". Supervisor: Prof. Nadia Innocente.
- Student: Luca Cadeddu, 06/2021 – 09/2021, Thesis title: "Beta-glucani da cereali: metodi di estrazione, caratterizzazione ed applicazioni in matrici alimentari". Supervisor: Prof. Donatella Peressini.
- Student: Luca Ius, 09/2020 – 11/2020, Thesis title: "Sviluppo di prodotti estrusi funzionali: problematiche e possibili soluzioni". Supervisor: Prof. Donatella Peressini.
- Student: Giulia Della Vecchia, 01/2019 – 03/2019, Thesis title: "Proprietà reologiche di impasti addizionati di fibra dietetica". Supervisor: Prof. Donatella Peressini.
- Student: Giada Busolini, 11/2019 – 02/2020, Thesis title: "Caratterizzazione chimico-fisica e nutrizionale di snack estrusi". Supervisor: Prof. Donatella Peressini.
- Student: Davide Sartori, 01/2019 – 03/2019. Thesis title: "Valutazione delle proprietà panificatorie di impasti addizionati di antiossidanti". Supervisor: Prof. Donatella Peressini.
- Student: Alberto Zamuner, 01/2019 – 03/2019. Thesis title: "Valutazione delle proprietà reologiche di impasti addizionati di antiossidanti". Supervisor: Prof. Donatella Peressini.

Master Students in Food Science and Technology (LM70):
- Student: Luca Cadeddu, 06/2023 – now, Thesis title: "Strategie per lo sviluppo di paste alimentari funzionali". Supervisor: Prof. Nadia Innocente.
- Student: Francesca Trevisiol, 02/2023 – 09/2023, Thesis title: "*Lacticaseibacillus casei*-group strains to counteract the late blowing defect of Montasio cheese". Supervisor: Prof. Nadia Innocente.
- Student: Luca Zucchini, 12/2020 – 03/2021, Thesis title: "Strategie per lo sviluppo di paste alimentari funzionali". Supervisor: Prof. Donatella Peressini.

Publications

Publications in international peer-reviewed journals

Moretton, M., **Renoldi, N.**, Anese, M. & Alongi, M. (2023). "Steering protein and carbohydrate digestibility by food design to address elderly needs: the case of pea protein enriched bread", LWT, 190, 115530. DOI: 10.1016/j.lwt.2023.115530.
Innocente, N., **Renoldi, N.**, Moret, E., Maifreni, M., & Marino, M. (2023). "Volatilome of brine-related microorganisms in a curd-based medium". *Journal of Dairy Science*, DOI: 10.3168/jds.2022-23051.

Renoldi, N., Melchior, S., Calligaris, S., & Peressini, D. (2023). "Application of high-pressure homogenization to steer the technological functionalities of chia fibre-protein concentrate". *Food Hydrocolloids*, 139, 108505. DOI: 10.1016/j.foodhyd.2023.108505.

Renoldi, N., Lucci, P., & Peressini, D. (2022). "Impact of oleuropein on rheology and breadmaking performance of wheat doughs, and functional features of bread". *International Journal of Food Science and Technology*, 57, 2321-2332. DOI: 10.1111/ijfs.15585.

Renoldi, N., Brennan, C. S., Lagazio, C., & Peressini, D. (2021). "Evaluation of technological properties, microstructure and predictive glycaemic response of durum wheat pasta enriched with psyllium seed husk". *LWT - Food Science and Technology*, 151, 112203. DOI: 10.1016/j.lwt.2021.112203.

Renoldi, N., Peighambardoust, S. H., & Peressini, D. (2021). "The effect of rice bran on physicochemical, textural and glycaemic properties of ready-to-eat extruded corn snacks". *International Journal of Food Science and Technology*, 56, 3235–3244. DOI: 10.1111/ijfs.14939.

Renoldi, N., Nadia Innocente, Anna Rossi, Milena Brasca, Stefano Morandi, Marilena Marino (2023). "Screening of *Lacticaseibacillus casei*-group strains as secondary bioprotective cultures for cheesemaking", *Food and Bioprocess Technology*, under review.

Rossi, A., **Renoldi, N.**, Marroni, F., Innocente, N. & Marino, M. (2023). "An integrated approach to explore the microbial biodiversity of natural milk cultures for cheesemaking", *Journal of Dairy Science*, under review.

Renoldi, N., Calligaris, S., Rossi, A., Marino, M., Nicoli, M. C. & Innocente, N. (2023). "Effect of the shifting from multi-materials towards more sustainable mono-material packaging solutions on the shelf-life of portioned semi-hard cheese", Food Packaging and Shelf-life, under review.

Publications in national peer-reviewed journals

Renoldi, N., Marino, M., Gandolfi, I., Bandini, E., Alba, G., & Innocente, N. (2022). "Oligosaccaridi e galatto-oligosaccaridi ottenuti da siero di latte: una revisione critica della letteratura". *Scienza e tecnica lattiero casearia - Dairy Science and Technology Journal*, in press.

Publications in national and international conference proceedings

Renoldi, N. (2021). Development of functional and innovative cereal-based foods with reduced glycaemic response. Proceedings of the "*First Virtual Workshop on the Developments in the Italian PhD Research on Food Science, Technology and Biotechnology*", pp. 403-407, online event (14-15 September 2021, Palermo, Italy).

Renoldi, N., Peighambardoust, S. H., & Peressini, D. (2021). Evaluation of physicochemical, textural, and glycaemic properties of extruded corn snacks enriched with rice bran. Book of Abstracts of the "*16th ICC Cereal and Bread Congress*", pp. 92, online event (29-31 March 2021, New Zealand).

Renoldi, N. (2019). Development of functional and innovative cereal-based foods with reduced glycaemic response. Proceedings of the "*XXIV workshop on the development in the Italian Ph.D. research on food science, technology and biotechnology*", pp. 147-149 (11-13 September 2019, Firenze, Italy).

Presentations at international conferences

Renoldi, N., Marino, M., Rossi, A., Brasca, M., Morandi, S. & Innocente, N. (2023). Exploitation of autochthonous *L. casei* group strains as secondary cultures to control blowing defects in PDO cheeses. *European Biotechnology Congress*. October 4-6, 2023 – Ljubljana, Slovenia. Oral communication.

Rossi, A., Marroni, F., **Renoldi, N.**, Di Filippo, G., Gover, E., Innocente, N. & Marino, M. (2023). An integrated approach to explore the microbial biodiversity of natural milk cultures for cheese production. 7th International Conference on "*Microbial Diversity, Agrifood microbiota as a tool for a sustainable future*". September 26-29, 2023 – Parma, Italy. Poster presentation.

Renoldi, N., Brennan, C. S., Lagazio, C., & Peressini, D. (2021). Effect of psyllium fibre addition on microstructure and glycaemic response of durum wheat pasta. 6th International Conference on "*Food Structures, Digestion & Health*", online event. Poster presentation.

Renoldi, N., Peighambardoust, S. H., & Peressini, D. (2021). Evaluation of physicochemical, textural, and glycaemic properties of extruded corn snacks enriched with rice bran. *16th ICC Cereal and Bread Congress*, online event. Poster presentation.

Presentations at national conferences

Renoldi, N., Marino, M., Rossi, A., Brasca, M., Morandi, S. & Innocente, N. (2023). Controllo dei difetti di gonfiore nei formaggi DOP tramite l'impiego di microrganismi autoctoni bioprotettivi. *7° Congresso Lattiero-Caseario, LATTE E DERIVATI: Una filiera che si confronta con la sostenibilità*. September 6-7, 2023 – Cremona, Italy. Oral communication.

Renoldi, N., Calligaris, S., Rossi, A., Marino, M. & Innocente, N. (2023). Shelf-life del formaggio Montasio DOP porzionato e confezionato con film a basso impatto ambientale. *7° Congresso Lattiero-Caseario, LATTE E DERIVATI: Una filiera che si confronta con la sostenibilità*. September 6-7, 2023 – Cremona, Italy. Poster presentation.

Renoldi, N. (2021). Development of functional and innovative cereal-based foods with reduced glycaemic response. *First virtual workshop on the developments in the Italian Ph.D. research on food science technology and biotechnology*, online event - Palermo. Oral communication.

Renoldi, N. (2019). Development of functional and innovative cereal-based foods with reduced glycaemic response. *XXIV workshop on the development in the Italian Ph.D. research on food science, technology and biotechnology*, Firenze, Italy. Poster presentation.

Attendance at other international conferences

October 2023	13th NIZO Dairy Conference, Innovations on Milk Proteins. Papendal, the Netherlands.

Attendance at other national conferences

February 2023	Annual conference of Associazione Italiana Società Scientifiche Agraria (AISSA) on "Le scienze agrarie nella bioeconomia". Bologna, Italy.

Awards, grants and fellowships

September 2023	Best poster presentation Award in "7° Congresso Lattiero-Caseario, LATTE E DERIVATI: Una filiera che si confronta con la sostenibilità" AITEL – Associazione Italiana Tecnici del Latte (Italian conference in the dairy sector).
February 2023	Michele Stanca Award 2023 for the best PhD thesis in the field of Food Science and Technology (Italian Association of Agricultural Sciences Societies, AISSA).
December 2022	One-year research grant at the Department of Agricultural, Food, Environmental and Animal Sciences (DI4A) of the University of Udine, consistent with the priorities of the National Research Programme 2021-2027 (PNR 2021-2027) and functional to present a project proposal under the HE – MSCA (Marie Skłodowska-Curie Actions)-PF-GF - call 2023 – action. Life Sciences Field.
July 2022	Postdoctoral fellowship at the University of Udine. Project title "Improvement of quality and sustainability in the production chain of semi-hard Italian cheeses". SDS: AGR/15 (Scientific supervisor: Prof. Nadia Innocente).
February 2022	Research fellowship at the University of Udine. Project title "Development of a sensory analysis panel for Montasio cheese". SDS: AGR/15 (Scientific supervisor: Prof. Nadia Innocente).
September 2018	Ph.D. scholarship in "Food and Human Health" at the University of Udine, Italy.
March 2017	Scholarship for European and extra-EU mobility for thesis research (Winnipeg – Canada).

Date 13-12-2023

Signature

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