DRG4FOOD's International Day of Women and Girls in Science

Their stories

Who is sharing its story?

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Claudia Zoani

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What inspired you to pursue a career in food data science and how did you achieve it?

Silke Weich:

"For me, the most fascinating motivation for engaging in food data science lies in <u>sustainability innovation</u>."

Through data science, we can model supply chain efficiency **to significantly reduce food waste across the entire food system.** This work extends to:
- ✓ analyzing the environmental impacts of different food production methods
- ✓ helping to identify and promote more sustainable practices.

Data science also enables **the optimization of resource use in agriculture and food processing**, ensuring that water, energy, and other inputs are used as efficiently as possible.

Furthermore, by developing predictive models for crop yields and quality, **we can better prepare for and adapt to changing conditions, ultimately contributing to a more sustainable and resilient food system.**

Sara Seweryn:

What inspired me to pursue a career in food data science was **a strong willingness to apply the analytical and problem-solving skills that I developed during my PhD in biophysics to a field that directly impacts on everyday life.**

The connection between data science and food system seems to me **like an opportunity to make a meaningful contribution to global challenges** such as sustainability, data security and health.

"Although I am still new to this field and learning every day, <u>I am excited by the challenges and opportunities it presents</u>."

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Claudia Zoani:

My motivation for working in food data science arises from **the recognition of the importance of <u>combining technological innovation with the tangible impact that data can have on the agrifood sector.</u>**

Leveraging data can in fact improve food quality, safety, and sustainability, addressing global challenges such as traceability and food waste reduction. During my professional experience, I have had the opportunity to contribute to projects and initiatives that integrate analytical approaches with ICT to support the agrifood.

Digitalization can transform agrifood supply chains, offering innovative solutions to address the challenges of the agrifood sector while improving efficiency, sustainability, food safety, and transparency. The solutions developed must not only be technologically advanced but **also relevant and applicable in a real-world context.**

"In this way, it is possible to contribute to the creation of a more resilient, sustainable, and future-oriented agrifood system, where digitalization and innovation act as catalysts for positive change across the entire supply chain."

What has been your biggest challenge or surprise while working with food data?

Silke Weich:

"Food data trustworthiness and supply chain reliability generally face several critical challenges."

Manufacturers might self-report food attributes without independent verification, using ambiguous terminology in ingredient lists. **The complex supply chain makes it often difficult to verify origin claims** and maintain transparency in processing methods. Quality assurance data and intermediate processing steps are often incomplete or inconsistently recorded.

Traceability gaps and time lags in reporting lead to outdated information affecting decision-making. Different data formats across suppliers complicate integration, while limited visibility of storage conditions during transport impacts food safety.

Additionally, **verifying organic and sustainable claims remains a significant challenge in the farm-to-table journey.** By reducing the complexity of international supply chains to a manageable level and harmonizing diverse global standards and control systems, we can hopefully address these challenges. To achieve this goal, we need **dedicated food data scientists who are committed to making positive changes.**

Sara Seweryn:

As someone who recently begun working in the field of food data science, my biggest challenge so far has been **understanding the complexity and variability of food system**, as well as the interdisciplinary nature of the work.

Emilia Pucci:
Working with food data presents several challenges.

"One of the challenges I have faced in my work is the accessibility and scarcity of data at certain stages of the agrifood chain."

Having complete and up-to-date data available during all the stages of the agrifood supply chain is sometimes very difficult, particularly concerning primary production.

For example, the main sources of crop production data are large-scale censuses or surveys. Many publicly accessible agricultural datasets are often collected through convenience sampling or opportunistic methods. Furthermore, farmer surveys typically rely on responses from willing participants. **This approach leads to biased datasets that are of poor quality and not representative of the overall data population.** In livestock farming, while methods of data collection have evolved, small and medium-sized enterprises still rely on traditional approaches for conducting censuses and valuing the land used for livestock farming.

The situation is even more complex for small businesses, where there is often a significant **overlap between the land used for agricultural purposes and that designated for livestock farming.** Additionally, data sets often lack details regarding the data collection procedures, the reasoning behind specific choices, the expertise of the annotators, and whether quality control systems are implemented.

This missing information, among other factors, significantly influences the quality and interpretation of the data. Moreover, sharing food production data between countries and organizations is often challenging, further complicated by inconsistent data privacy protocols and platforms.

Do you believe that food technology (particularly apps) takes women's needs into account when designing user experiences? If not, why?

Silke Weich:
I imagine that there are technologies in the multitude of applications that are particularly responsive to the needs and basic data of women. I am thinking in particular of nutrition apps or apps that combine physical fitness with nutrition.

> "Nevertheless, I believe that there is still a lot of potential in technology for applications in the food chain that women in particular can benefit from."

Example 1: In international development cooperation, market women could perhaps get **better access to goods with the help of technical applications** if they were in direct contact with rural women farmers and could do business online.

Example 2: **Information about the origin of food and whether women in particular were involved in its production** is helpful for people who want to align their consumer behaviour with the advancement of women.

Sara Seweryn:
I believe that the world is changing rapidly, and food technology is **progressively considering women's perspective when designing user experiences.**

A female perspective can contribute to the development of more inclusive, intuitive, and user-focused solutions, ensuring that technology aligns on a more personal and practical level. Therefore, I believe that incorporating diverse perspectives, including women's, **is essential for creating technology that effectively meets the needs of all users.**

Valeria Poscente:

> "Food technology and apps have made significant progress in personalization, but they often lack a gender-inclusive perspective."

Many apps designed for nutrition tracking, meal planning, or food safety tend to be generalized, failing to consider specific nutritional needs related to women's health, such as hormonal cycles, pregnancy, or menopause. Moreover, food safety and traceability apps rarely address household food management, which often disproportionately affects women in many cultures.

The design of these tools should go beyond basic nutritional recommendations and integrate more inclusive, science-backed features tailored to diverse physiological and lifestyle needs.

What advice would you give to young girls who are enthusiastic about data science?

Silke Weich:
In the field of food data, data science is particularly fascinating because it enables **the discovery of hidden patterns in consumer behavior and dietary habits, and solves concrete problems in food safety and traceability through innovative algorithms.**

The creative combination of nutrition science, computer science, and statistics leads to new insights about the relationships between diet and health. With growing amounts of data, forward-looking predictions can be made for sustainable food production and consumption trends. The democratization of this knowledge also makes insights about food quality and safety accessible to a broader audience.

Nevertheless, it is important that we always keep in mind that all data processing **must remain fair and transparent, benefiting all humans and protecting our planet.**

Sara Seweryn:
Although, I don't have extensive experience in food or data science yet, I see myself as a scientist, and my advice to any young girl in any field of science is to **stay curious and persistent**.

To me, science is all about exploration and problem-solving, **so don't be afraid to ask questions, experiment, and learn from failure.** Remember to **believe in your abilities and not let self-doubt hold you back.**

Most importantly, enjoy the journey, celebrate your achievements and never stop trying to make a difference with your work.

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