EIT FOOD:
Welcome back to the Food Fight podcast, exploring the greatest challenges in our food system and the innovators dedicated to solving them. Clara Talens and the team at AZTI Food Innovation Centre in northern Spain are working at the intersection of food and health, using technology and data to drive the future of nutrition. Their latest work highlights a critical challenge. We're living longer than ever before, but not always healthier. The question is no longer just how to extend life, but how to extend the quality of life. This is the backdrop for the ImmuGold project, a public-private initiative aimed at improving the health of older adults through smart, science-driven nutrition.

Carla Talens:
Hello, my name is Clara Talens. I'm a senior researcher at ASTI, a food innovation center based in the north of Spain. A few years ago, I was coordinating the Food for Seniors project, which was funded by EIT Food, where we focused on texture-modified products adapted to the needs of elderly population. The results from that project were promising, especially by collaborating with food companies, but we wanted to move a step forward and introduce not only pleasure regarding improving texture for the elderly, but also including ingredients that can have a health effect on their immune system. And this is where the project ImmuGold was born. So to create a bit of a context, we are living longer than ever before, but not necessarily healthier. And this raises an urgent question. So how do we ensure that those added years are not just longer, but better? So here is where ImmuGold has its motivation behind. It's a public-private collaboration. and recognizing which are the needs of the elderly adults, which are population between 60 and 75 years old. This is a pivotal life stage, still active, still independent, but increasingly vulnerable to chronic inflammation, weakened immunity, and nutritional gaps. So EMU Gold's goal is simple but ambitious, to develop a plant-based functional beverage that meets the specific nutritional needs of elderly adults with ingredients selected not just for their nutritional value, but for their proven effects on immunity, inflammation, and oxidative stress. In Spain, actually, we have a high rate of population between this group. What ImmuGold wants to be, it's not only one single solution related to an alternative to a farmer, a pharma or a medicine. What we want to create, it's a proof of concept to show that innovation in food systems can be smart, inclusive and data-driven and focus on impact. So we can create new value for the food industry while also delivering value for public health because we can improve health through nutrition. We are facing a future where one in four Europeans will be over 65 by 2050. So this is not a crisis, it's an opportunity. But only if we act now to create solutions that help people age well, not just longer. And in that context, nutrition is like a frontline tool. So the EMUGOL project shows that food can do more than feed because it can prevent, protect and promote wellbeing. So through careful formulation and science-based ingredient selection and clinical validation, we can build a product

that doesn't just follow market trends, but leads with purpose. So to understand what makes Imocold innovative, we have to start with a challenge that every food developer faces, but few talk about, which is how do you choose the right combination of ingredients, not just for taste, but for function? So how do you ensure that the plant-based drink, which is actually our prototype in here, delivers on its health promise? This is where data science and machine learning comes in as a first step. At the core of InMOOC goal, there is a computational modeling approach developed by ASTI. Instead of starting with trial and error in the lab, we begin by analyzing massive datasets on the nutritional composition, techno-functional properties, even environmental impact, and health-related bioactivity of hundreds of ingredients. Then we integrate data from open access nutritional databases, scientific literature, supplier data, and even results from our own previous experiments. And then we use predictive models to simulate how combinations of ingredients might behave, not only in terms of nutritional content, but also in terms of processing stability, sensory acceptance, and most importantly, potential health impact, particularly on the immune system of the elderly. This allows us to make science-informed decisions about what to include in the formulation and just as importantly, what not to include. For example, the models can tell us how sensitive certain vitamins or polyphenols are to industrial processes like UHT treatment, helping us anticipate nutrient losses and plan accordingly. So once the best candidate ingredients are identified, we move into the formulation phase, led by Costa, which is a Spanish company specialized in plant-based beverage development. And here we create the lab-scale prototypes, adjusting variables like the base matrix, oat, almond, pea. The functional ingredient dosages, very important, texture, and flavor. We will perform the nutritional and physicochemical characterization, stability testing, and sensory analysis, including with other consumers to ensure real-world acceptability. Then the top performing prototypes will be then scaled up in pilot industrial trials using GOSTAS facilities and applying food safety protocols, of course, Two versions of the beverage will be produced, a control without the functional ingredients and the final formulation enriched with our selected nutrients. And this will be packaged identically to maintain the double blind conditions in the clinical trial. Finally, we will enter the validation phase coordinated by the University Rovira Virgili, who will conduct a randomized double-blind placebo-controlled study in 110 early elderly volunteers to test the effects of the beverage on chronic inflammation and immune function. During the clinical trial, we will measure outcomes that are related to immunity. So we will also determine which is the baseline, because since the project started, what we have carried out is the systematic review, especially on what has been done previously. And to be honest, it has been really, really hard to organize that information because many trials related to immunity include participants that are sick, and this is not the case. So we want to target a group that is actually healthy, but is vulnerable to this kind of disease or chronic inflammation infections, slow recovery from illness and higher risk of diseases like cardiovascular disorders, etc. By consuming this product and also in

a particular dose and in a particular period of time, they should have less risk of getting these diseases. The dose is everything and the product would be formulated to be like a glass, 250 milliliters. But we will also take into account safety. So if there is, if they take two glasses and there is no risk of having an extra dose of vitamin or a particular mineral. And for sure, education is everything. And during the recruitment of the participants, they will also take part of this participatory research methodology. where they not only participate in the trial so we can obtain information from them, but they are also part of the R&D development process and how to communicate the benefits of the products to a target group like them.

EIT FOOD:
Those hit hardest by health challenges are often the ones with the fewest resources. That's why ImmuGold is carefully considering the cost of their ingredients, and making sure that education about their product is part of the package. In a market full of bold claims and enticing packaging, it's important to Clara and the team that their messaging is clear and backed up by data-driven evidence. For ImmuGold, the success of their product will ensure that the future of elderly health isn't solely on the shoulders of the healthcare system.

Carla Talens:
something that we have also taken into account when selecting the ingredients, because in some of the trials that were actually effective in the past, what the nutrient that was given to the participant was either a supplement or a socket of really expensive microorganisms to constitute the probiotic drinks. So what we wanted to do is to create a product with ingredients that are sources of, because the higher the purity of a compound, the most expensive is the product. But you can reach the required amount of particular nutrients that gives you the right to put the claim in your product by introducing sources of this nutrient. But this requires a lot of calculations and also a lot of trust on the ingredient suppliers. We will always recommend companies where we work with to select this type of ingredients only if they have been approved by EFSA or if they have been tested in a clinical trial. EFSA is the European Food Safety Agency. food literacy, consumer education. People do not understand labels. We do not have time to read. So there's a big difference between food marketing and then the claims for food legislation. There is a clear differentiation here. So you can claim health effects in your packaging only if they have been approved by EFSA. And the sentence is very, very particular. So you have to put that sentence in your packaging. You can say it improves or it keeps to maintain, et cetera. But around that, there is a whole world of food marketing and then a lot of, not even, letters, even a symbol can create confusion. Stomach and hand looks like it's good for your digestive system, but if you don't put it in a sentence, you are not breaking the law. For us as an innovation center and especially science-based innovation center, when speaking about food product

development, it's very important that we align science, in this case clinical trials results, with legislation. So right now, we're in the formulation and industrial trial stage. So we have selected the ingredients. We are then contacting with the suppliers, analyzing the different technical specification of the ingredients. Then we enter the formulation step. a pilot prototype should be ready by the end of this year. Then the formulation needs to be also very, very defined because the other colleagues from the University of Rovira and Virgil who will conduct the clinical trial, they have to undergo the ethical committee. So this is another milestone here because this committee from the university needs to approve the ethical aspects of our trial. and they need to know the composition and the supplies, and then you cannot change anything from there. If it gets approved, this is the formulation that goes to the clinical trial. But also the prototype needs to undergo scalability. So if you have it at lab scale, you have to be able to produce it at industrial scale, especially when there is a food company involved in this project. So by the end of 2027, we should have the final prototype ready. the ethical committee approved and carry out actually the clinical trial, which will take 12 weeks with 110 early elderly population. And then time to analyze the results and provide recommendations, even some claims for the product by the end of 2027. It would be great in five years time. So the future of health doesn't just belong to hospitals or pharmacies. It also belongs to supermarkets, to kitchens, and daily habits. I would say that would be my main purpose, and I would be super happy if, as a researcher, I can contribute to that, to democratize the health effects of functional foods.

EIT FOOD:
The ImmuGirl project offers a bold idea that a carefully designed functional food could help older adults strengthen their immunity and live a healthier later life. But turning scientific concepts into everyday products is never straightforward. Clinical trials will test the claims and only time will tell whether results live up to the ambition. What is clear is that nutrition will play a central role in how we approach aging in the decades ahead. And ImmuGold are hoping to provide a key solution in supporting health and easing the burden of healthcare systems in the future. Thank you to everyone for tuning into this week's episode. This has been the Food Fight podcast. If you'd like to find out more, then check out the EITFood website at www.eitfood.eu and join the conversation via the hashtag EITFoodfight on our LinkedIn channel at EITFood. And of course, if you haven't already, please hit the follow button so that you never miss an episode. Thanks everyone, see you next time.