Mycotoxin Matters podcast – Episode #23

**SPEAKERS**

Announcer, Professor Chiara Dall'Asta, Martin Minchin

**Announcer** 00:02

Welcome to the mycotoxin matters podcast from Alltech mycotoxin management. As mycotoxins present an ever-increasing threat to livestock production, join us as we discuss these impacts and potential solutions, sustainable farming and our vision for a planet of plenty.

**Martin Minchin** 00:22

Hello, everyone, and welcome to our latest episode of the Mycotoxin Matters Podcast. I'm Martin Minchin, Marketing Manager for Alltech's Mycotoxin Management programme. On today's episode, we're delighted to be joined by Professor Chiara Dall'Asta. And over the next 20 minutes or so, we'll be discussing a study that was recently published in the Journal of Exposure and Health, which assessed what will be the mycotoxin related health impacts of shifting from meat-based diets to soy-based meat analogues. Professor Dall'Asta is currently an associate professor of food chemistry at the Department of Food Science at the University of Parma in Italy and is a well-known and highly respected researcher in the area of mycotoxins. In addition to her research activities, she is also an expert member of several working groups of the European Food Safety Authority. Many listeners with all also recognised Chiara from a role on the steering committee of the World Mycotoxin Forum. Chiara, it's wonderful to have you join us today.

**Professor Chiara Dall'Asta** 01:17

Hello, Martin. It's really wonderful to be here today. I'm really honoured.

**Martin Minchin** 01:22

Before we get into discussing the actual study, Chiara, it would be great if you could give a brief background to yourself, the University of Parma, and the fields of study that your research team focused on?

**Professor Chiara Dall'Asta** 01:32

Yeah, so definitely. So, you are you're right. I'm a food chemist, I have a strong analytical background. And my main area of research is food safety, mainly mycotoxins. My group is based at the University of Parma in Italy Department of Food and Drug, and our university has a really strong vocation in food science. This is our core business, indeed, from the primary production to processing Consumer Science and Human Nutrition. And this is mainly due to the area because our area is highly specialised in the agri food sector. Recently, my group has gained expertise in circular bio economy. That's the reason why I started working on plant-based meat analogues. We are mainly working on the valorization of agro biomasses especially for the production of plant-based protein. So, my basic question at the beginning of my research, so the topic of this podcast was about the safety assessment of these products as well, because a lot is known about the nutritional profile, but very little about the food safety.

**Martin Minchin** 02:46

Chiara, would you say then that that's probably the main reason that you conducted such a study? And I'd be interested also to know if there are any studies such as this carried out previously, is it a new topic for the research area?

**Professor Chiara Dall'Asta** 02:59

Let me say that it's a quite a new topic. There are several studies in the literature, mainly about microbiological profiles, or let me say, allergenic profile, which is quite an issue for plant-based protein, I will have, at least from what I know, our work is the first focus on mycotoxins under the first modelling the exposure. So, it was quite a new work in the field. And the idea came, really from some projects carried out in collaboration with the European Food Safety Authority and leaders as you told me before, the European Food Safety Authority was, I was part of the sub working group in the past, and the authority is based in Parma as well. So we have quite a strong collaboration. Yeah, we saw a lot of work about the nutritional advantages, the plant-based food, but none of them addressing the safety profile and the mycotoxin especially.

**Martin Minchin** 03:58

What would you say, Chiara, were some of the key findings of the study? One of the areas I thought was most interesting was the fact that although removing processed meat from our diets may reduce cancer risk, higher or more unexpected risks could actually arise if mycotoxins are not properly regulated in these plant-based meat alternatives. So interested to hear, I guess, yeah, some of the key findings from the study. And also, was there anything in there that may have surprised you or was unexpected?

**Professor Chiara Dall'Asta** 04:30

Yeah, I mean, I think the key point is that there's no black and white in food science. So, we all know, or we all have read that removing red meat from the diet is beneficial in terms of colon cancer risk. On the other side, when you change your diet, you also change your exposure to some contaminants. Regulations are usually based on exposure assessment and occurrence data, and food items that are considered the real contributors to the exposure, the main contributors to the exposure are those that are regulated. So, if you eat a small amount of foods that are not really high contributor in your diet, these foods are not usually are not covered by regulation. And this is the case of legumes. So nowadays, we all eat legumes, but not in very high quantity or let me say, not in amounts that may be responsible for high contribution, but when we shifted the diet, from meat to plant-based analogues, so 100% meat will become 100% plant-based analogues, then also your exposure or your consumption of different plant-based protein would be quite important in terms of contribution. So nowadays, legumes are not regulated for mycotoxins, although we all know, as a scientific community that mycotoxins may occur and do occur in legumes, but they're not regulated so far. The key point of our study is that imagine you will eat only plant based or legume-based food in your future, you will be exposure to such an amount of mycotoxins that you will be, you will undergo to a risk of developing cancer, let me say a comparable or even higher risk than the one you have by eating red meat. This is quite important to underline, I think. And this is probably the key finding of my study.

**Martin Minchin** 06:50

Really interesting Chiara, and I think if I'm right in saying it was aflatoxins and ochratoxins in the study that you and your team focused on. Is that correct?

**Professor Chiara Dall'Asta** 06:58

Yeah, exactly. Aflatoxin and ochratoxins, which are the most important mycotoxins and legumes. So far, we didn't consider Alternaria toxins, which are also occurring in legumes. But at the moment, we don't have enough data from a toxicological perspective to include them into the risk benefit modelling. And we didn't consider fusarium toxins just because they are less relevant for the matrix. Yeah, so aflatoxin and ochratoxins mainly.

**Martin Minchin** 07:30

The study Chiara, it was based on Italian consumption data.

**Professor Chiara Dall'Asta** 07:34

Yeah.

**Martin Minchin** 07:35

And also, I think I noted, the consumption data was from 2006, almost 16 years ago, I guess two questions within that, you know, will this risk differ if this study was applied to a different region outside of Europe? And then if anything, I guess in terms of the older consumption data, would it change if this was more recent?

**Professor Chiara Dall'Asta** 08:00

So, starting from the last, we have very old consumption data nowadays available, we based our study on the European consumption data database from the European Food Safety Authority. So EFSA, we only focused on the Italian diet, because we know the Italian diet quite well. So even if, let me say, in spite of the old data, okay, we were able to put in place some corrective measures, we are not able to do the same with all data coming from other countries. So, the point is that collecting data for consumption is so demanding in terms of efforts that the European Union, the European member states only do it over some years, so let me say, probably now they are putting together data from new surveys, and maybe something will come available next year. But yeah, again, the very old data completely not mirroring our current diet style. Yes, coming to the other question, I totally agree with you. If I change from Italy, to Germany, and I would try to model Germany, German exposure, or maybe I don't know, Scandinavian exposure or exposure from UK, or Greece, I would expect different results. In Italy we have let me say, pseudo-Mediterranean diet is no longer the classical Mediterranean diet as in the past, but it's more adherent to the med lifestyle, so a lot of veggies and so on. Probably in other countries, the intake of meat is higher. On the other way around, we are quite used to consuming a high amount of processed sausages. So, this could be quite a contributor in terms of risk concerning red meat. So, I would expect different results, for example, in Greece, where they have surely different consumption in terms of vegetables and meat, but also from the other way around in Eastern Europe or northern regions. Yes, it would be really interesting to check the exposure country by country with pretty new data consumption data, I mean.

**Martin Minchin** 10:37

Looking at some of the commentary online Chiara, there's been a there's been an audible response, I guess, to the study with it being such a novel and new topic to explore. What would you say, if different stakeholders are looking at this study? What would be the implications for thinking in particular food producers and consumers?

**Professor Chiara Dall'Asta** 10:59

Yep. Considering producers or industries, I must say that we had only positive feedback from them at the moment. So quite nice feedback. I'm really happy to say the food supply chain, it seems to be very interested. We had already some contact with them planning further studies in this direction, I think they are interested in getting more aware of the risk connected with their product. And in particular, they would like to know if processing may be a mitigation tool. This would be a very important question. So maybe they can put in place some innovative solutions or some innovative processing technologies, they may help them to keep under control the risk or the mycotoxins occurrence along the production chain. So, this is for sure for them a very important question. Let me say something similar to the acrylamide toolbox. So, it would be very interesting for them to start quite in advance to have data to build up a toolbox, okay, to be able to keep under control the risk. On the other way around, also regulators seem to be really interested to the topic, of course, they need more occurrence data, they are asking for more occurrence data, and they will, once they will have data, they will be able to perform a thorough risk assessment maybe based on recent consumption data, and this will be the base of possible future regulation in the field. So why not maybe in five, three, five years, we could even have limits for mycotoxins in plant-based proteins or plant-based food. Consumers, this is quite let me say, a complicated matter, or itchy matter. Because, yeah, we don't want to set any alarm or any, to cause any crisis. The sector has improved a lot, has grown a lot. Over the past five years, a lot of people all around Europe are keen to change the diet and to buy more plant-based food. So, the message from us is not, don't eat these kinds of products, the message is please push the sector to put in place the right safety measures, which is different. Okay. So, I think that discussion with consumers is open. It's really important that the scientific community is engaged and try to transfer to deliver in the in the right way the message, but we also have to be really careful in not causing any alert or let me say panic or untrust in consumers.

**Martin Minchin** 14:24

I fully agree Chiara and I think, yeah, the topic of mycotoxins within the consumer community, is always one of the more sensitive ones, but it's an issue that is becoming more and more I guess, mainstream. And I think only earlier this week. We saw in Kenya a significant food scare with rice in that country and the government there, they recalled a large shipment of rice due to contamination with aflatoxins as well.

**Professor Chiara Dall'Asta** 14:52

It's the climate change crisis, yeah, everywhere.

**Martin Minchin** 14:55

Yeah, of course, and that's going to become a much bigger topic, as we think of the years ahead. Chiara, looking ahead, maybe to the future, then, for your team and maybe other teams of researchers also, how would you say this study maybe sets a benchmark for further studies? Do you have specific plans to follow on with research in this area? And are there maybe recommendations of areas that you feel we should be exploring more and more that maybe were not included in this particular study?

**Professor Chiara Dall'Asta** 15:25

Yes, so, at the moment we are busy with collecting occurrence data from the market, to enlarge the database for exposure assessment, so this is for sure the first step in the pipeline. We have very nice analytical methods so we can really start collecting the accurate data and provide data to the regulators as well. We have also some contacts ongoing with companies in the field, especially regarding innovative ingredients. Yeah, they are mainly interested in setting up studies for understanding the processing, in particular extrusion of protein. So, working on the extruded material, to see if this kind of treatment may mitigate the occurrence of mycotoxins so this is another step in the pipeline, in our pipeline. Then, of course, we are chatting with the authorities to see if we can collaborate in collecting data or running model for the future. This is just about mycotoxins, but I think we have to enlarge a little bit our vision and maybe go for natural toxins. So not only mycotoxins, but also alkaloids. I mean, we have the recently regulated tropane alkaloids or pyrrolizidine alkaloids or why not other plant alkaloids that could be interesting as well. And maybe it would be nice to merge natural plant or natural mycotoxins with other natural, toxic compounds like anti nutritional factors, protein, anti-nutritional factors, or something similar, which can be present in these kinds of products. So, to have a thorough and comprehensive view on the safety of plant-based meat and milk analogues, because we focus on meat analogues here in our study, but there's also a lot of interest around milk analogues. So, all the oat, or almonds or whatever, plant milk. So, this is more or less what we have embarked on in the pipeline. And of course, we hope that also through this discussion, webinars, podcasts or whatever the interest may grow, and maybe we can capture some funding for collaborative projects, this would be really important for us in the future.

**Martin Minchin** 18:05

I'll finish on a topic, Chiara, that has been pretty much front and centre of everyone's minds for the past, the past year or so. The war on Ukraine. In the lifestyle category, it's meant for a lot of changes have occurred in terms of people switching to buy products and so on where grains and raw materials are not available. Is the same applying to consumer foods? Is it having any impact on the safety profiles of certain ingredients that are used in foods destined for the the end consumer?

**Professor Chiara Dall'Asta** 18:38

Unfortunately, yes, I think this is a very tough question. It deserves a lot of time to be discussed really in depth. But the raw material market is totally disrupted at the moment, the consequences, at least to me will be up for years. So many common, usable, raw materials are simply no longer affordable for companies. This is the feedback we have from our partner companies. Or at least they are not affordable in the amount they need or in the quality with the quality level they need, or they used to have. So, there are changes ongoing in the food formulation. Companies are looking for new ingredients from new geographical areas. Yeah, this is good in a normal situation. So, it's always nice to have innovation or new materials, new opportunities. But when this is forced by the global crisis, as it is at this moment, and when it's so quick, and driven by the economic crisis, then our feeling, or my feeling in particular, is that the risk for food safety is becoming higher and higher. So, I don't know, I think that we all as a scientific community must be really proactive in monitoring the scenario keeping everything under control. Understanding what is going on and supporting companies in making choices and preventing potential crisis, I think these will be an issue for the coming years. Yeah.

**Martin Minchin** 20:23

Yeah. And I think unfortunately, you say coming years rather than coming year, it does feel like it's going to be a turbulent few year ahead. And something that's going to be solved all that quickly. So, something certainly for stakeholders, right throughout the food and feed supply chain to consider.

**Professor Chiara Dall'Asta** 20:39

As we all hope, even if the war will be over maybe soon, and we all hope for this. I think the raw material crisis will be here for a long time. That's the point. Yeah, that's my feeling at least.

**Martin Minchin** 20:57

Yeah, for sure. I think that's the that's the reality. Chiara, it's a fascinating topic, and we really appreciate you taking the time to join us on the podcast today. It feels like an area that is certainly going to attract greater attention in the future. So, we'll be certainly keeping a close eye on it and the work of your team. As the research evolves, I'm sure we may have you on to join us again to discuss further updates to the scientific work that you're carrying out. And to our listeners. We hope you enjoy this episode. And we'll be back next month with our final episode of mycotoxin matters for 2022. Thank you.

**Professor Chiara Dall'Asta** 21:33

Thank you very much. Thank you.

**Announcer** 21:36

We hope you enjoyed listening today and look forward to you joining us next time on The Mycotoxin Matters podcast. For more information on the topics discussed, please visit knowmycotoxins.com That's K N O W mycotoxins.com