

Mycotoxin Matters #34 - Transcript

SPEAKERS

Paula McCooley, Reg Smith, Nick Adams

Nick Adams 00:01

Hello, and welcome to this episode of the Mycotoxin matters podcast. This is the second in our series related to different species. And today I'm joined by Reg Smith, who is a strategic poultry adviser to the Alltech business, and by Paula McCooley, who is the poultry manager for Ireland. And our focus today is on breeders. My name is Nick Adams, global director for the mycotoxin management team. And perhaps, Reg, we could start with yourself, and you could give us just a little bit of a background but it's a little sort of context for us in terms of why are we interested in the topic of mycotoxins around the breeding flock? What should we be concerned about when we think about these birds perhaps more so than when we think about some of the other birds that we are feeding within the cycle?

Reg Smith 01:04

Okay, thanks, Nick. And hi everybody, so mycotoxins and for the audience's benefit, I've been in the industry for about 40 years, mycotoxins has never really been a subject that we would discuss much agriculturally. The, well, I think the term mycotoxins came out in 1962. So it's relatively new. But we would not have really looked at it hard because we didn't know much about it for one and also, on the back of that didn't think it was doing us any damage. But the reality is mycotoxins are ubiquitous they're certainly in all the grains that we have, may be low levels. If you've got corn in the diet, if you've got DDGs in the diet, then there's a higher risk level. But the ultimate impact of those sometimes is masked. So if you're in a broiler operation, you'll see up and down performance, is that due to the management is that due to the chicks or the feed, or is it due to hidden mycotoxins within the diet that is generally goes unknown. The bigger impact as we're discussing today is really the breeding stock. So you've got your higher generation most people who've got breeding stock will have parents stock, some of you may have GPs. Those are high value birds, which live a long time. And it's the time that they live, which is quite an interesting factor because whilst in some places of the world and Western Europe being a case in point, you would not generally expect to see much in the way of mycotoxins. As I said earlier, there are mycotoxins there. And those over the length of a long life can have quite a detrimental effect on the breeding performance. And when I say detrimental effects, in relatively minor circumstances, you could be losing 10 to 15 chicks per breeding hen. So what's that? Roughly 10% of your income has gone for no other reason than potentially mycotoxin presence within diets. Not only will it affect those breeders, but unlike a lot of things that do come and go, once you've had a hit from mycotoxins within the breeders, they're unlikely to regain the breeding potential that they had. So if they get hit early in the life in week 22, 24, 25, that's going to impact the whole laying cycle up to the 60, 65 weeks, whatever age you kill the birds at. So for the breeders, it's a bit of an insidious one. You hope you don't get a problem. If you do, the likelihood is going to rob the performance and rob the performance for the rest of the birds life. The final part I'd say Nick is when you look at that chick moving into the broiler division, it's likely to be impaired some way, for those that hatch. If there's been

mycotoxins, you could well have impairment of the checks which could be stunting and runting syndrome. You quite often get gizzard erosion, sorry, mouth erosion ulcers in broilers receiving mycotoxins so there's a raft of things, that if you class the breeders as your building blocks, then your building blocks have been knocked about by an early attack, early presence of mycotoxins within the diet, which has then gone downstream and affected the boilers. Does that sort of answer the question or lay it out?

Nick Adams 04:39

It does. I think there's plenty to build on from there, Reg. And so perhaps, Paula, we could come to you and Reg I think mentioned that particularly there the lifespan and then some of the key things that we may see within the bird. Maybe you could dig into that a little bit more and maybe give us a bit of a bit of information around what are the things that mycotoxins are doing to the bird that ultimately then results in some of the challenges that we see and that Reg alluded to?

Paula McCooey 05:16

Yeah, thanks, Nick. So the impact of mycotoxins on poultry is complex, because sometimes we see clinical symptoms, but more often than not with chronic exposure, the symptoms are less obvious. So some of the key areas that are affected in breeders are damage to the organs so such as the GI tract. And so we see things as Reg has mentioned, like mouth lesions, damage to the gut wall, and that can then lead to reduced feed intake and reduced nutrient absorption. Gut health then is also impacted and that has a negative consequence on all performance. So we may see raised mortality, litter issues and we can also see a drop in egg production and egg quality. Poor fertility, that is another key area, obviously, in your breeder operation, and that is impacted. It's a common symptom of mycotoxin contamination in both males and females. And then I'd say the final one is your immunity and vaccine failure. So that's a key area affected by mycotoxins and it's probably one of the more subtle ones. But we do know that mycotoxins even at low levels can impact the innate and acquired immune response in birds, which in turn decreases the response to vaccines. So then, of course, as Reg has said, as well, having impacted the fertility, egg quality and immunity of the broiler breeder, it's hardly a surprise that we have negative consequences for the progeny of those birds. So we say poor hatchability, increased embryonic mortality at the hatchery, and then the day old quality is affected as well.

Nick Adams 06:54

So I think what you said there is I mean, we are, when we think about mycotoxins, they can be the root cause of a lot of different things. Because of their effect on some of the sort of fundamental processes within the bird, they can then sort of trigger or catalyse or potentiate larger effects. Reg, maybe coming back to you then, and you've touched on this a little bit, but sort of finance wise, what does that mean for the producer for the bird initially, obviously, but then for the producer.

Reg Smith 07:33

Well individually, it's going to have a fair impact on your returns. As I said, if you've lost 15 chicks, you've lost 10% of your revenue. So I don't think many, many farmers out there would sit comfortable with losing 10% of their revenue, from what effectively, for most people is a hidden assassin, because they don't know why it's happening. And unfortunately, you then spend a heap of money trying to solve a problem. So in a lot of things in agriculture, when things go wrong, you tend to throw the kitchen sink

at it. And then you start pulling away the supports that you've put in at the end of it, to see which one actually solves the problem. So when you don't know the actual outcome, or the initiation of the problem, you're going to spend a lot of money investigating a problem, probably using technologies or products that aren't going to sort it. And then at the outcome, maybe the problem dissipates, if you're lucky. But as I said in breeders, you're still going to have the hang on effect. So the overall effect is quite significant to a breeding farm. Bearing in mind, a breeding farm produces eggs from about 24, 25 weeks of chick production, up to 60 weeks, and then it finishes. It's a long life. But it's a difficult life when you start off with a flock that has been impaired early on. And you've got to keep that flock all the way through to the end, because they'll still be eating the same amount of food they may actually be eating more food, particularly if they've impaired their own guts systems. To put a direct value on it is difficult because it depends where you are in the world. Your input costs and your the revenues you get paid.

Nick Adams 09:19

And clearly the finance piece. Yeah, it can be significant. And when you talk about some of the numbers that when you think about what the potential loss could be, then they become really significant. What are your thoughts around, you know, the concept of the lower-level challenge and sometimes we say it may be easier to spot that real acute challenge, something that comes in hits the birds really hard and it's very, therefore very, very visible. Paula alluded to those sort of chronic challenges. Are they more difficult to spot because actually, you don't necessarily see them as easily but they're still robbing the system.

Reg Smith 10:04

Completely 100% agree with that statement, you've got a situa- if you're in certain parts of the world where you're using a lot of maize or corn, and you know the harvest wasn't good, the storage conditions aren't good, you're going to be pretty well alerted to the fact that any problems you're seeing in your livestock, in this case, breeding poultry, could well be caused by mycotoxins. But in a lot of places in the world, it's it's one of these things that is out of mind, because you don't have an easy way of seeing the true effects, as you say, is underlying. There's symptoms. There's all sorts of odd symptoms going on, but not one that you can put your hand on. And in order to get to the answer that you've really got to start digging into testing, not only your feed, but your raw materials, your storage bins, and it's quite a lengthy process. If I break my leg, I'm pretty sure I broke my leg, yeah. But when I get a pain in the back, where's that pain in the back coming from? Is it my knee? Is it my ankle? Is it? Is it the way my head sits on the shoulder? You don't know. And so it's one it's a bit like the pain in the back. It's a problem, you know, you think you've got but you don't really know what's causing it. But in order to solve it, you've got to do quite a lot of investigation.

Nick Adams 11:23

I like the way you didn't mention age, Reg.

Reg Smith 11:28

Nothing to do with age.

Nick Adams 11:33

Paula, Reg has maybe segwayed quite nicely into the next sort of area that we could pick up on which is risk and where risk is coming from. Harvest is going on in a lot of places around the world at the moment. What are the thoughts around potential risk that's coming down the road for us next year?

Paula McCooley 11:57

Yeah, so in the 2023 harvest, we are expecting to see an increase in mycotoxin contamination and that is due to the extreme weather events that we've seen. So from droughts in western U.S., floods in South Asia, heat waves across Europe and extended monsoon seasons in India. Globally, this is going to be an issue. If we look at the current landscape say, for some of the early data coming in from the European harvest, we're seeing an average of 4.4 mycotoxins per sample, with 93% of those samples containing two or more mycotoxins. Emerging mycotoxins, Type A and Type B trichothecenes are the most commonly occurring mycotoxins found so far. And if we look at the risk profile just for those early samples that have come in and specifically for breeders, 60% of the samples are moderate to high risk for breeders. So we're still collecting samples, it's still at the early stages for Europe. And it'll be several weeks before we have all of the analysis done. But what we can say is that we've seen in the field, the crops had been stressed, the weather events have definitely had an impact. And we are expecting to see an increase in mycotoxin contamination across all small grains.

Nick Adams 13:19

Certainly interesting, particularly when you mention small grains and something again, more related to perhaps some of the recent European analysis that we've done, where typically, we've seen quite low risk associated with those small grains, but this year, you know, quite a different harvest season. And so interesting to see that that risk profile coming in from the initial samples is significantly higher.

Paula McCooley 13:49

Yeah, definitely, if we compare it to last year or even the year before, when we looked at, say European wheat and barley for poultry, it was overall fairly low risk. But that's definitely not the case this year so far.

Nick Adams 14:01

And it's the same mycotoxins primarily we're thinking about those fusarium mycotoxins but we're seeing higher levels.

Paula McCooley 14:12

Yeah, that's right. A higher level, it's more concentrated and a higher number of mycotoxins per sample.

Nick Adams 14:18

Yeah. And then from what you're saying, it'll be interesting to see when we think about those the monsoons if we think further south and, and some of the weather events that we've seen over in North America to see the impacts that they have as we start gathering data from those countries as well, in the next weeks ahead.

Reg Smith 14:41

I think, Nick, can I just because I found this really interesting thing about the mycotoxins. We always talk about the weather events being a factor. I think it's important to understand that the mycotoxins actually only come out of these fungi when they're stressed. So the stresses can be various things. But clearly hot weather stresses them. Probably very damp weather, I don't know, but it's likely to, but they produce the mycotoxins as a byproduct it's not a natural process that they've always produced them it's when they're stressed, they produce them. So we talk about bad harvests, we talk about bad storage conditions and those storage conditions can be where you get the grain from in the first place, to your own bins on the farm. And there's a number of areas where if you do not look after A) the grain that's standing in the field, how you've cut it and stored it, and then the transportation and the processing into the feed mill, you can equally get mycotoxins so don't think it's a problem that only sits out there on the farm, or in a store. It's right across the whole supply chain. So in a year, like we've seen with the weather patterns that we've seen, quite likely, there is going to be more and as I think Paula's just alluding to, we're already seeing that in the testing that goes on.

Nick Adams 16:08

Absolutely. And I think one of our challenges, as you mentioned, in a more difficult harvest season, we are more likely to bring in higher levels of that contamination, both the mould and the mycotoxin contamination. And of course, the poorer quality we are dealing with from the field comes all the way through because that mould is present and therefore, it puts even more emphasis on the storage conditions to allow that grain to be stored to maintain its integrity throughout the year because someone's got to store that grain for the year as we feed it out over this next season. So it's a good point, Reg and maybe Paula coming back to yourself, then what should people be doing now, thinking about the testing side of things, so that they can understand whether it's a feed mill or a farm, they can understand what the potential challenge they have in, in the grains, in the feeds they're feeding.

Paula McCooey 17:14

Yeah, so understanding the contamination profile of the feed, the feed itself and the raw materials used is key to managing the risk of mycotoxins. I think from a feed mill point of view, it's not enough to just rely on the shipping data that you might get or to take a sample of one sample from a cargo because we know there's huge variation within cargoes within one feed load. And then, like we've just said, there's also possibility for further contamination during storage. So it's not enough to rely on that, I think you need a regular and comprehensive testing programme that identifies a broad range of mycotoxins, and that should be put in place to identify the level of risk to birds. So that's regular testing of both raw materials coming in, and then your finished feed. At feed mill level, that will allow you then to identify your high risk raw materials, what load that came from what country maybe is more risky than others. And especially when you're feeding a high risk species like breeders, to then try to reformulate the diet to maybe reduce the amount of your high risk material that's needed, or to use it from a different source that's maybe of a higher quality with less mycotoxin contamination. So that's your first sort of line of defence as such. But that it's not only enough to have testing in place, you also need to have a bit of a database or a system in place to track compare on trend your mycotoxin data, so that it can allow you then to assess if you have issues on farm performance issues or issues in the hatchery, that you can actually go back and look at the feed that was given to these birds and say, Is it a mycotoxin issue? Could it be? And is there further work to be done to look into that. And that sort of takes the guesswork out of the chronic exposure and the things we were talking about earlier about how it can be difficult to

actually identify a mycotoxin issue on farm. But if you have that sort of database setup, that can really help the investigation.

Nick Adams 19:30

So then, Reg, if I come to you, and so producers have the testing side of things in place, and we'll perhaps touch on the data side of things as part of this. So I'm testing, I have data, how do I interpret that data? If I'm a producer or a farmer? You know, I've got lots of numbers. What do those numbers mean?

Reg Smith 19:59

Okay, so make sure I do answer your question, Nick, because I might go off piste slightly in answering it. You end up with, and I've sat in many nutritional meetings over the years, looking at or asking about mycotoxin levels and everybody says, well, that's okay. It's, it's within legally acceptable levels, so don't worry about it. But the reality is, there are a number of mycotoxins, as Paula has just said, in virtually every sample of grain of food that you've got. And we've always sat there and said, well, at a certain level, it's below the standard, the advisory levels, the legislative level, so don't worry about it. But the reality is, you get a synergistic effect when you've got 2, 3, 4 mycotoxins even if they're individually at a low level, synergistically, they can have an effect. And certainly through the testing that Alltech has done, they've come up with a scheme which is basically gives a unit value it's called an REQ, don't worry about what are the REQ stands for but the REQ is a view of the relative effect of those group of mycotoxins when synergistically working together, have in relation to a standard unit, which, if I remember correctly, is against aflatoxin. So it's just giving you a benchmark, so you'll get a number to say you've got 30 REQ. Is that important to you or not? Well, if you've got 30 REQ, and you've got three mycotoxins pushing into that, that may well be enough to cause your problem. If you had 80 REQ, that's probably definitely going to give you a problem. So it's giving you more of a sense of direction, when you've got some results in front of you with terminologies around what mycotoxin it is that you've never even heard and you've got a number. But now you get one number. And that one number gives you a guide. And if you actually take and there's standard ways of doing this. If you take a new graph, the mycotoxins that you've got over time, and as you increase the mycotoxins look at the performance degradation that is likely to come from it. As that number gradually goes higher, the degradation you will get in the performance increases. So notably, I think we're going to talk about the study that was done, where they looked at, I think it was 16, or 17 crops continually of broilers and predicted from the mycotoxin analysis, whether there'd be an effect on the performance, then having predicted where the hits would be, they looked at the performances, and on each one where they said, we would expect at this REQ level, the performance of broilers to be hit, sure enough, when they looked at the physical result that was gained on the farm during that crop, it was generally the food conversion that got hit by three, four, five points. Now, as an agriculturalist, without that knowledge, I would have sat there and just looked at that and said, right, what did we do chaps? What went wrong on farm? Was it the chicks? Was it the feed? Is it the management? Did we not clean...? There's 101 things I would look at. And historically, I would never have then thought well hold on. Do we know about mycotoxins? So, pick up on me in a minute, Nick, if I haven't answered your question. So I would then in today's world with breeders, I'd be saying well, I know from what I've said earlier, I know that if I hit those breeders at all, that performance loss is going to hold throughout the life of the bird. So I'd look at it and say, Paula's just spoken about the harvests, about where you know the problems around the world. I'd be sitting

there and saying, it's not worth me spending time waiting to find out if I've got a problem with breeders. Because if I, by the time I've got a problem, and I found out about it through my testing, let's assume I'm not testing all the time. If I then spend time testing it, the problems already there. So in my world today, I then look at it and say right breeders I need a way of protecting them from the potential, the risk. Now I'm pretty sure in saying that once you've got a mycotoxin hit in your birds or your pigs or your cows, there is no treatment. For mycotoxin poisonings, there is no treatment. But what you're trying to do is prevent the mycotoxin poison from actually hurting the animal in the first place. So that's where, in my world, I will be putting a mycotoxin binder into the front end of the rearing diets and the breeder diets to protect those birds. You pays your money and takes your choice on broilers. Do you want to ride the risk? Because unless you've got, as Paula said, a testing programme, you won't know whether you've got a problem or not. On breeders, by the time you've got a problem, it's too late. So for me and the value of the breeders, I protect them at the start, right, the way through. Sorry did that answer the question?

Nick Adams 25:36

It did look, I think it did, and I think it is that piece around, you talked about the REQ concept and how that simplifies the approach, or that ability to bring together all of those mycotoxin numbers, it's then a number that can easily be translated between, or referred between different raw materials and feeds and seasons, to give an easier way, I think of, of looking at the relative risk that we're facing. And I think then, you know, what you're saying is all of the things that Paula said, are very applicable, because on an ongoing basis, you want to see what is going on. When it comes to breeders, the insurance piece becomes a really important part of that programme, because actually, as good as all the testing programmes are actually solving problems in real time, it's difficult. So unless you're sort of in front of it, then you're behind it effectively. And with breeders, you don't want to be behind it.

Reg Smith 26:51

Absolutely, absolutely. Absolutely right.

Nick Adams 26:55

Well look Paula, Reg, really appreciate the time. Thanks for all of your words of wisdom. And I hope everyone has enjoyed this episode in the series and we will be back with the ruminant episode in the near future. Thanks very much both

Paula McCooey 27:15

Thanks for having us, Nick.

Reg Smith 27:16

Thank you