30 Brave Minutes Podcast
College of Arts and Sciences, UNC Pembroke
Transcript: Episode 54
Recorded July 19, 2022
Released November 15, 2022

Dr. Allen
Welcome to 30 Brave Minutes, a podcast of the College of Arts and Sciences at the University of North Carolina at Pembroke. In 30 Brave Minutes, we'll give you something interesting to think about. I'm Ashley Allen, Associate Dean of the College of Arts and Sciences, and with me is Associate Dean, Dr Joanna Hersey. Joining us is Dr. Nicholas Negrin Pereira, Assistant Professor of Animal Science in our Department of Biology, here at UNCP. Now get ready for 30 Brave Minutes! Tell us about yourself a little bit Nico, thank you so much for joining us today.

Dr. Negrin Pereira
No, no, my pleasure. Thank you so much for opening this space to tell a little bit, just a glimpse, of the research I'm doing. My name is Nicholas Negrin Pereira, most people call me, Nico, like a short name for that. I'm originally from Uruguay, South America, which is a very small, tiny country, three million inhabitants, between Brazil and Argentina. Why I'm telling you guys this, because we are in the middle of the pampas, the guacho land, and that is related to some of the research I'm actually conducting here at Pembroke.

So that means that, and is related to my position here at Pembroke, I'm responsible for the animal science side of things. Which, for me has been a great challenge and a pleasure to be working on that. By formation I'm a DVM, Doctor in Veterinary Medicine in Uruguay. From my early beginnings I had a strong interest in cattle fertility and reproduction. So, I also did a Master of Science degree in Aberdeen, the true Aberdeen, in Scotland. We have some other Aberdeen here in North Carolina, of course. I did a Master of Science in Animal Reproduction.

And then I work as an Embryo Transfer Technician in cattle, and artificial insemination, for 23 years, when I decided to do a PhD, a completely change of life from that side of things. So I did my PhD in Fargo, North Dakota, and I worked with bulls, after working most of my career with females, with cows, so I kind of change sexes in the sense of my practice, and I started working with bull fertility. And I can explain you, why bull fertility.

Dr. Allen
Well, so that leads me to, I guess my first question. What, you sort of said you had already, I guess, always been interested in cattle reproduction.

Dr. Negrin Pereira
Yes.

Dr. Allen
What sparked that initial interest for you?

Dr. Negrin Pereira

Well, we can say that I was beaten by an embryo. The first time I look at an embryo, seven day old embryo, cattle embryo, I was just fascinated by the structure. It's a round sphere, perfect as a football, perfect, as most biological structures, with a bunch of cells inside, and that is the seven day old embryo, which we call a morula, because it actually looks like a blackberry and it's still free floating in the uterus. So, from the first moment, I saw that embryo I say I want to do this, I want to work with these structures, which is so close to the origin of life, right? And then I of course, always like, I was always very close to farms, cattle farms, big farms in Uruguay and in Argentina and in Brazil. And I say, yes, kind of these two things really compliment so well, highly specialized training and work. And do some research, but also the practical application of things. Every time I conceive or think about my research, I think about applicable research. I, of course, respect basic science, I think it's necessary and great, but what I do, my incentive is, okay, I got the results, I'm going to design a management recommendation for the producers, make it practical. That's me.

Dr. Allen

That's fascinating. And you said you had switched over for your PhD research to look at bull infertility, and that's what you're doing your research on today?

Dr. Negrin Pereira

Exactly, and that is started because one day driving with my advisor, my PhD advisor, we were talking about what I could potentially do. And then he mentioned that no one was actually working with bulls. And then I said, wait a second, why no one is working with bulls? 'Well, I don't know, Nico, there seems to be no interest in bulls.' When I started getting into the literature, there's a kind of complete, an unexplained imbalance, between the amount of research being done in cow reproduction, on the female side, but very little is being done in the male side. So I say, well, why not? And then, when you get into the statistics by the USDA, the last one we have the census is 2017, more than 92% percent of the calves born in the U. S. are born from a bull, that means that we know many things that they are born many of them are from artificial insemination. But still the adoption of the technique of artificial insemination has been really slow. So, most of the offsprings we have, the animals we see, they actually come from a bull.

Okay how does that relate to my research? On the other side, when you think about the fertility, the responsibility of a female, or a bull on a herd, if for some reason, the bull cannot conceive, or get pregnant, we will be losing one calf. Right? But if one bull has a fertility problem, just to give an idea, we normally use bulls at a ratio of one bull for 25 to 50 females. So, in under natural mating conditions. That means that if a bull has a fertility problem, we will have a much bigger problem. We will have 25 to 50 non-conceiving cows in our herd. So, I say, come on, let's pay more attention to our bulls.

Dr. Allen

So, tell me a little bit about the research that you're working on right now, and trying to determine sperm production is that correct?

Dr. Negrin Pereira

Yes, basically yes. Well, with this background, I told you about the importance of a bull. When I started getting into the literature as a PhD student, and I really, I'm thankful that I had that chance to have the time to look into literature. I came across a group of cells called Sertoli cells. The name come from the surname of the Italian researcher called Enrico Sertoli, who discovered these cells in the testes. Why? Why did I became fascinated by these cells, well it's very simple. The more cells, or the more of Sertoli cells or B cells, the bull has established in the testes before puberty, the more sperm he's going to be able to produce in a 24 hour basis. Why is that, because these cells are the ones that nurture and hold the sperm cells in the testes, they're responsible for the spermatogenesis, or the evolution of these from the spermatogonia to the spermatozoon. And then, the other fascinating things about these cells, they actually replicate within a very short, narrow period of time, which is from the fetal stage until puberty. Once they will reach puberty, or the animal reaches puberty, they stop replicating. So that means that we have a short period of time where we might intervene and apply treatments, and have an effect on the number of Sertoli cells in the testes. The more cells we get in the testes the more sperm the bull is going to produce. So that was my main line of research, as a student, and then I've been developing this line, through these recent years, we can say.

Dr. Allen

Wonderful, when it comes to involving students in your research, how easy or hard has that been? Have you seen that they're really fascinated by…

Dr. Negrin Pereira

Oh, gosh.

Dr. Allen

Yeah?!

Dr. Negrin Pereira

Yeah, I even had to put a limit and say, okay, guys, I cannot take more. Yes, I mean, they've been incredibly, there is a really, really strong interest on the animal side here at Pembroke. I think students are looking for that, and this is really a good compliment because we have, of course, all the field work, when we actually apply the treatments on the bulls, we castrate the bulls. They have hands on the surgical procedure. They have hands on taking blood samples, measuring the scrotal circumference, palpating the animals, and they are just fascinated. And so we go from the field, towards the lab, where they even received, this year we were lucky, because all my students could actually participate in a microscopy training session that took place at the Biotech Unit here at Pembroke. So they go from, again from the field from being all covered in cow, you know, to actually having, operating with a highly sophisticated, epifluorescent microscope. Right? So, one of the things I've been developing is the use of immunohistochemistry, using immunofluorescence, using antibodies. against specific cell markers, in this case, we use Wilms' tumor 1 to actually show our cells. I can even share some

images with you, and show you that, which is kind of really fascinating. So, now we're in the process of, we finished recently finished taking the images, so we're in the process of starting, processing those images, and making the cell counts.

Dr. Allen

Wow, okay. So what is going to be the next step with the research? So you're looking at your cell counts if you find support for your hypothesis where do you go from here?

Dr. Negrin Pereira

Well, if we prove our hypotheses, and we actually fulfill our objectives, we will be moving forward, because the other thing I want to add here, and I don't know if I can move a little bit from, with my own perspective of things, and one of the things I achieve, and I think I'm really happy for that, is, of course, that students producing scientific data, producing posters, and they did some presentations at North Carolina Academy of Sciences, and the PURC (Pembroke Undergraduate Research and Creativity Symposium) as well. But the other thing is, we are working with other three institutions, and this is really, I think great, because at some point, I say, well, I have to start looking for the bulls. I need a research station, I need the field. I need the lab. I need everything. So I started joining part and I received, I have wonderful receptivity from UNC State, They provided the animals, they provided the experimental farm.

And then I've been working with the Biotech Unit here at Pembroke, with all the microscopy, and also with the pathology core lab, at the Cancer Comprehensive Research Center, Lineberger, that's the name, in Chapel Hill, with our sister University. So this is one of the great achievements with this project. We managed to actually fuse together all these institutions, and we're working all together in different the different aspects of this research.

As you asked Ashley, if the hypothesis proves true, we will be moving towards other projects, which actually compliment this project. One of them is going to be supplementing lactating calves. Normally, a calf is weaned when it's six months of age. So, during that period, when it's still suckling the mother, we will be providing supplements as grains, maybe corn, soyabean meal to increase protein and energy and see if we have an effect on the testicular growth and development. We already know according to the literature review we did, but no one has looked at the cytology. That's what I'm interested in.

And the other one is, you know, North Carolina is within what we call the fescue belt. We use fescue as a pasture for producing our cattle here in North Carolina and that's the other aspect of my research. I always like to do apply things to the geographical area where we are. Okay, that correspond to our state. So just to give an idea, 8.5 million cattle are actually fed every year on fescue. and this fescue is infected with an endophyte, which is a fungus, which produces alkaloid and produces what we call fescue toxicosis. Well, there's very little work, very little research on how the fescue toxicosis affects the reproductive parameters in bulls.

And that will be also one of my other steps, the other institutions, especially NC State, they are really interested in keep on pursuing that line of research, which I think is great for us, and for our students, because they interact with students from other universities, and you should see those conversations. They are amazing. They are great.

Dr. Allen
Have you had a lot of interest from area, like cattle farmers, just trying to figure out how they can take your research findings and improve their yield?

Dr. Negrin Pereira
Yeah, one important funding source for this type of research is the North Carolina Cattlemen's Association, for example, they have what they call the beef checkoff. They actually charge the producer one dollar per every head of cattle that's being sold in the state, and that money is used, this is a fantastic problem, because that money actually returns and goes to research, applied research, for that. So that's one of the grants or areas I want to explore and they've been also really supportive from the very beginning.

Dr. Allen
Okay, that's wonderful. I'm sitting here thinking of all of my colleagues and friends out there who actually do have cattle, and I'm like, they need to know these things. So I'm sure they do. But that was fascinating. When you're looking at your research up to this point, what's been the thing that's been the most surprising for you? Have you had any of those findings that really caught you off guard?

Dr. Negrin Pereira
The most surprising is I feel I'm moving a curtain of a whole spectrum of new things. I can see, and this is one of the fascinating things of research, sometimes we are more concentrated on significant differences and effects, but one of the side effects of research, and I think that's great, is looking at new roads to walk down, new lines of investigations that are produced after you finish one research. And that is what happens to me. I have on my white board, a whole list of new ideas that come to my mind after every research, and I think that's the main value of research. Exploring new routes, exploring new roads and, of course, getting information. So we can use on the field, applying that, on actually practical matters.

Chancellor Cummings
This is Chancellor Robin Cummings and I want to thank you for listening to 30 Brave Minutes. Our faculty and students provide expertise, energy and passion, driving our region forward. Our commitment to Southeastern North Carolina has never been stronger through our teaching, our research and our community outreach. I want to encourage you to consider making a tax-deductible contribution to the College of Arts and Sciences at the University of North Carolina at Pembroke, with your help, we will continue our impact for generations to come. You can donate online at uncp.edu/give. Thanks again for listening, now back to more 30 Brave Minutes.

Dr. Hersey
So this is so interesting, Nico, thank you for sharing all of this about the different interest points that come into it and I'm curious about our students that are working with you in the field, and

how they came to this topic of research. What have they shared with you about what brought them to this topic?

Dr. Negrin Pereira

I think it's the interest for animals, they're dying to work with animals. They truly dying to have their hands on live cattle, and I'll tell you an anecdote, this student, she's a really nice girl and by the way she has been accepted to the Royal Veterinary College in London.

Dr. Hersey

That's wonderful!

Dr. Negrin Pereira

So Cindy Clemmons, one of ours, that's one of the most gratifying things. See the students fly high.

Dr. Hersey

Wonderful!

Dr. Negrin Pereira

Anyway, she was embracing the cattle and the calves and, and another girl she was a little bit afraid of getting close to the animals and when you start talking to them, she said that that was the first time she came in close contact with cattle, and for me, that's really gratifying. Being part of that bridge between people that might have a vocation for that, but never knew how to to do it, how to get close to an animal, how to get into the farming world. And that, for me is one of the missions I feel more gratified actually linking students with the farming world. But also with the lab and with the science, and trying and putting all these things together and producing high quality product. That's great.

Dr. Allen

What are some examples Nico of your students' career goals, like and what they want to do next? So, for example, when you have students who come do research with you, what does that set them up for in terms of their future plans?

Dr. Negrin Pereira

Well, you know, some of them are still trying to figure out where they want to, I mean, they know they want to work with animals, for example, or they want, they know they want to be on the biological science or life sciences we can say, but they still don't have clearly in mind, and I can offer them that as well. So, they see the whole process from the field to the lab. Some people tell you, 'no, no Nico, my vocation is on the field, I want to be with the cows, I want to be with them, and touch them and work with them,' which is, of course, I love that. That is great. Others, tell you 'no, Nico, I'm more, I want to be a rat lab. I want to be in the lab I want to work with the images, I want to work with microscopy and all that,' and that's fine. And that's, I

think, is part of our mission here is show the students. And that's the other fascinating thing about animal science. There's no limit on the application where you want to work.

You want to work in the lab, you will work in a lab, here you will get the location you might need for that at Pembroke, and that will open your doors. You want to go into the lab, you will be able to go to the lab, you want to stay in the field you will stay in the field as well. So that's, I think is in a young mind, is to actually push them high as much as I can, but at the same time, show them the different options there. If there is a career that offers you a place in the industry, or a place on a farm, or a place on a university, or a place on research, that's animal science.

Dr. Hersey

And it sounds like you have a mix of students that you're working with, some of whom haven't had a lot of large animal experience, it sounds like.

Dr. Negrin Pereira

Yeah.

Dr. Hersey

But also, maybe some of them who grew up on farms, do you have a mix of that background in the students you're working with?

Dr. Negrin Pereira

Yeah, normally, and even in the classroom you know, I teach quite a few courses in animal science, Animal Nutrition, Introduction to Animal Science, I also teach Zoology, of course, with side a little bit of a sidetrack on using cattle examples, livestock examples, and then this semester we'll be offering the Physiology of Reproduction, which is my main field. So you can see in the classroom a little bit of everything. People that never got in contact with cattle and people that have been raised on a farm. And I always tell them don't be discouraged, I'm not asking for previous experience. In fact, I love to get new people, completely out of the field and get them into the field, and of course, it had to be a gentle introduction, guided, but that's that's again part of the gratifying work we have here at Pembroke, and, of course, my main aim is to get this program get bigger, and better.

Dr. Allen

I love that. Do you have a favorite moment or story that you can share from any of your, I mean, you had a long career in veterinary medicine, and then sort of making the shift over to academia sort of almost two lives. And so actually, maybe I have two questions because it's like, I want to know about a favorite moment or story, but I also want to know how your previous work, how you feel that makes you better for where you are now?

Dr. Negrin Pereira

Well, I have so many stories, but anyway, but all these years of field experience and work has actually give me a broad vision. Even though I'm a specialist in reproduction, and a specialist in

in embryo, and sorry, and cattle fertility, and in this case in the bull, but I, those years of practice also gives me the broad perspective, because reproductive technologies are tools. But they are just tools, they should be integrated in the whole production system. And so that's, and probably that's come from expedience from permanent contact with the field, with the farming world.

And a special moment is, I will recall two things, one is the big smiles you get when, and the pride of the students producing a poster, presenting a poster, that enlightens their life, I think. That's very gratifying for us because it's their job. Okay. It's your product. And that's great to be proud of. And the other thing is the happy faces when they hug a young calf. And that's great because you can see that link between the human and the animals, which, of course, I love so much and that's probably the two snapshots I'll take with me.

Dr. Allen

Those are wonderful stories and I resonate with you. I was just talking the other day about undergraduate research, and that mentorship, and just getting students into the field and this hands on applied way. And there's no other feeling like that when you see that, you've opened their eyes to a whole new world. And it sounds that you're really doing that in a very real tangible way, out there in the field. You know, the literal field doing that!

Dr. Negrin Pereira

You know Ashley, I always tell my students that they are driving the car. I'm seated on the passenger seat. So if they want to drive a Ferrari, they will, they want to drive a very old model car, and 20 miles an hour, they will do as well. And my role is to guide them, make sure they don't crash against the wall. Guide them, but they are the true actors here. We are just a tool. an educational tool, but they are the ones who drive the car so I always tell them at the same time, it's good to like the practical, the field work and all that, but don't forget you, you're going to be professionals. And you have to study hard, and you have to get the knowledge. Because that's what people will look for you, being the best professionals, you can be. But also practical people, that's that's how I see things. That's my perspective. But without always forgetting that you come from a university, and you are working hard in college to get a degree, and that's the real value, but again, they are the drivers. I'm just the passenger.

Dr. Allen

I feel like that is one of the huge advantages of UNCP is the fact that we are so teaching focused, and because we're primarily undergraduate, those undergraduate students who are passionate and who want to engage in research, they actually get, they have a lot of open doors for them in terms of how much hands on activity they get to do, that I don't think you really see in a lot of other places because that tends to go towards the graduate students.

But that's something that I've heard a lot from our students is just that they feel like the faculty are more receptive to really partnering with them, even though they're young and they're trying to figure things out, that they have a more personal connection to what they're doing.

Dr. Negrin Pereira

Yeah, and I think it's from the first day I got into this position here, one of the things that really seduced me was the ratio between professors and students, and that actually puts you in , probably, I can't think about another institution that does that, and that ratio allows you to have really close contact with the students, know them well, know their goals, where do you want to go, where they come from and where do they want to go. And that's of course, is unique of Pembroke. No doubt about it, it’s a very special atmosphere.

Dr. Allen

Well we're incredibly thankful to you and for what you're doing to promote animal science at UNCP, and to help that side of our huge agricultural program that we're going to build and that we're working on. So, I'm so thankful for you taking the time to speak with us today to share a little bit about your research, and the passion that you have for student engagement. And I look forward to having you on again for a follow up in the future.

Dr. Negrin Pereira

Of course, you're more than welcome, I'll be delighted. And again, I really want to thank you for this space for giving me the opportunity to share with you what we are very humbly doing, but of course, always dreaming of our great big animal science program within the agricultural program. Thank you so much.

Dr. Allen

Thank you.

Credits

This podcast was edited and transcribed by Joanna Hersey, and our theme music was composed by Reilly Morton.

This content is copyrighted by the University of North Carolina at Pembroke and the College of Arts and Sciences. It is to be used for educational and non-commercial purposes only and is not to be changed, altered, or used in any commercial endeavor without the express written permission of authorized representatives of UNCP. The views and opinions expressed by the individuals during the course of these discussions are their own and do not necessarily represent the views, opinions, and positions of UNCP or any of its subsidiaries programs, schools, departments, or divisions. While reasonable efforts have been made to ensure that information discussed is current and accurate at the time of release, neither UNCP nor any individual presenting material makes any warranty that the information presented in the original recording has remained accurate due to advances in research, technology, or industry standards. Thanks for listening and go Braves!