

# LEADER EXTENSION

by

In addition to his duties as a meat science extension specialist, University of Wisconsin-Madison associate professor **JEFF SINDELAR** is leading efforts to close the science gaps in Appendix A & B.

by Julie Larson Bricher, science and technology editor



**I**f you need answers, Jeff Sindelar is your guy. If it pertains to meat science, that is.

And, if the University of Wisconsin-Madison associate professor and meat extension specialist doesn't have them right away, he will seek until he finds.

"My driver, especially on the meat extension side, is to never lose sight that we're here as service people, helping others be successful," Sindelar says. He spends about 80% of his time conducting extension outreach for 450 meat and poultry establishments in Wisconsin and 20% doing applied research "with practical value intent."

"Whether it's troubleshooting a situation or finding and producing scientific information to empower people," he adds, "what I enjoy most is giving them knowledge and helping them be more confident in applying science in whatever they are doing."

Over the past 12 years, Sindelar has extended his extension philosophy into a signature leadership style. He has created multiple nationally known meat science programs and developed a successful first-of-its-kind Master Crafter Meat Training Program. As well, he serves as a member of the steering committee for the design and development of UW-Madison's new Meat Science and Animal Biologics Discovery Building set to open in summer 2020.

Last year, he was invited to chair the North American Meat

Institute's Appendix A & B Core Working Group, an academic-government-industry collaborative effort that is reviewing the scientific hurdles presented by the original versions of the guidance documents. The group aims to fill the science gaps and propose solutions to overcome them before final revisions are issued by the USDA Food Safety and Inspection Service (FSIS) later this year.

Sindelar spoke with *Meatingplace* about how his meat extension know-how and research activities guide his leadership efforts to strengthen the science base and the practical usefulness of Appendix A & B for both industry and regulators.

**Meatingplace: What do you enjoy most about being a meat scientist and an extension specialist?**

SINDELAR: Anyone who is a meat extension specialist is [doing it] as a service to others. That is one of the things that attracted me so much to extension.

But it's rarely an easy thing to do because you might have some small operations that really struggle just understanding basic science because they don't have that training.

I always try to remember that regardless of what the question is, either simple or overly complex, you're still helping by providing science-based answers.

I'm always learning more. Just recently, I received a question about Salmonella Reading and brines, and the impact that tem-



Read more about the Appendix A&B Working Group at [meatm.ag/mindthegap](http://meatm.ag/mindthegap)



## SCIENCE CRED

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### NAME

JEFFERY J. SINDELAR, PHD

### POSITION

ASSOCIATE PROFESSOR AND  
EXTENSION MEAT SCIENCE  
SPECIALIST

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### UNIVERSITY

MEAT SCIENCE AND MUSCLE  
BIOLOGY LABORATORY,  
UNIVERSITY OF WISCONSIN -  
MADISON

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### LEADERSHIP

EXECUTIVE COMMITTEE, FOOD  
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CHAIR, NORTH AMERICAN  
MEAT INSTITUTE APPENDIX A  
& B CORE WORKING GROUP;  
MEMBER AND FORMER CHAIR,  
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### RESEARCH INTERESTS

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ACTERISTICS OF PROCESSED  
MEATS, NON-MEAT INGREDIENT  
FUNCTIONALITY IN MEAT PROD-  
UCTS, THERMAL PROCESSING  
AND PATHOGEN CONTROL AND  
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NEBRASKA-LINCOLN; M.S.,  
MICHIGAN STATE UNIVERSITY;  
PH.D., IOWA STATE UNIVERSITY

peratures and other factors could have on some specific meat products. I pulled up my little library and looked at what I had on salmonella. I was like, 'Dang it, I don't have enough in here.' I'll need to find the time do a deeper dive. It's challenging and fun. There is definitely never a dull day in this role.

**Meatingplace: You've taken on leadership roles on several fronts, whether it's chairing the national NAMI Appendix A & B working group, developing new university extension programs or providing input into the design and operation of UW's new meat processing science center. What are your drivers?**

SINDELAR: I don't do anything that special. I just do things the way that I think they should be done, and I try to use my talents and skills to execute them. I'm proud of the research we do at UW because we take a strategic approach. We get the right people together [and] spend 80% of our time planning and 20% executing the plan. We make sure that we have the right parties there to represent all the different aspects of science as well as the industry. That way, the scientific findings have the highest chance of being applicable to actual problem-solving in meat applications.

For sure, I don't sit here and say, 'Well, Appendix A is a stupid way to cook meat. Throw that in the trashcan.' That's not me. I want to be someone who uses my resources, uses my scientific training and stays constantly exposed to some of the concepts and principles that are going on in science.

I want to understand the needs of the industry and then figure out what it is that we need to do to, both scientifically and practically. Let's come up with a plan, let's charge forward, let's make sure that we aren't excluding any [stakeholders], and let's go after it. Let's get it done.

Now, when you put that work process

## SCIENCE *profile*

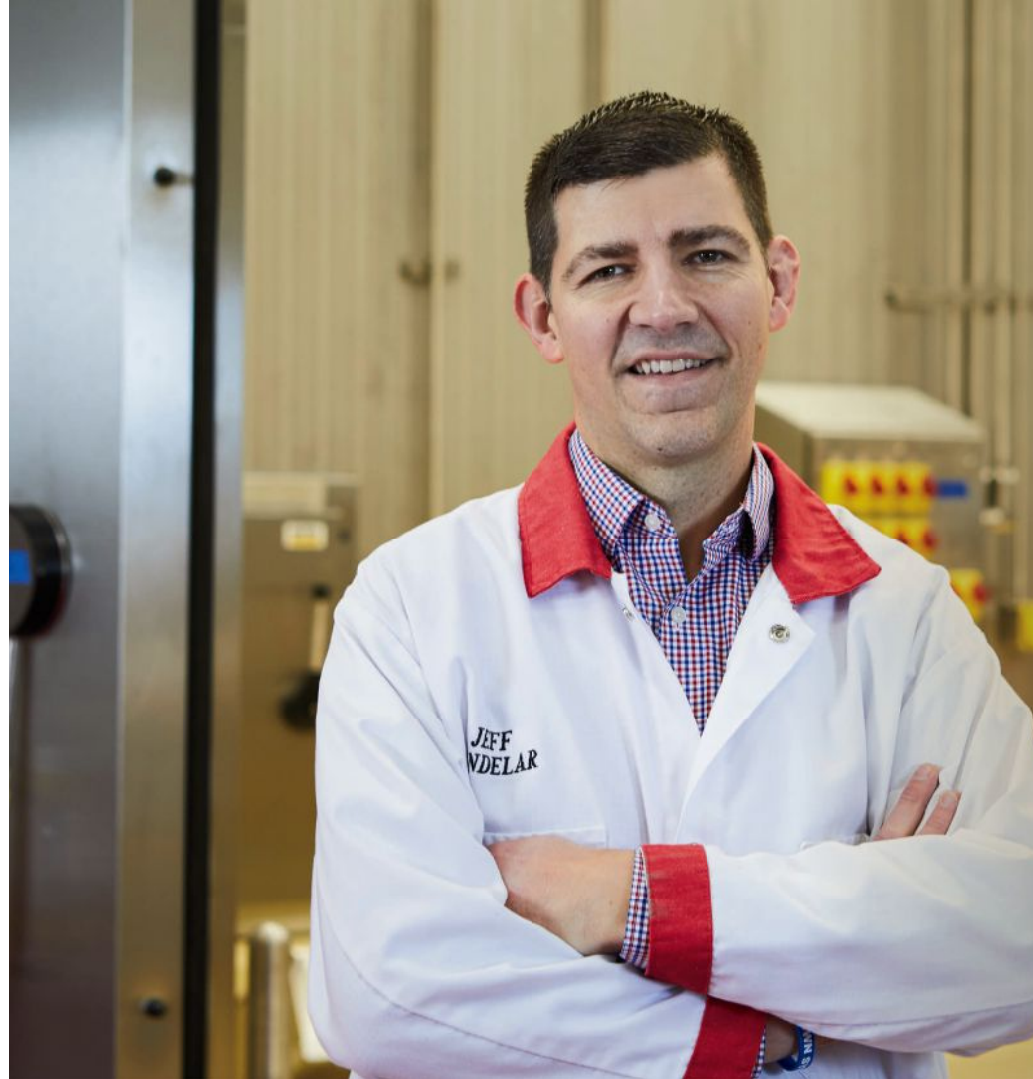
into the scientific world, it's beautiful, elegant. You may have little bumps and hurdles along the way but when the process works, it's a beautiful thing.

**Meatingplace: How long have you been doing research in the thermal processing area, and was that driven by specific queries from industry?**

SINDELAR: When different companies contact me with the same types of questions and I can see a clear trend, I try to build research in that area. About 10 years ago, I was starting to get questions about certain aspects of Appendix A, and so we wrote a grant proposal to [what was then called the American Meat Institute] to investigate those industry concerns.

It just so happened that about the same time, there were also some concerns coming from USDA FSIS because Appendix A was being used for a lot of other products besides beef and roast beef. That was my first real jump into thermal processing research.

We've been doing research since then, and I've been looking at different parts of Appendix A. I knew 10 years ago that Appendix A was outdated from a scientific perspective. Of course, as everyone clearly knows now, [the guidance] is not appro-



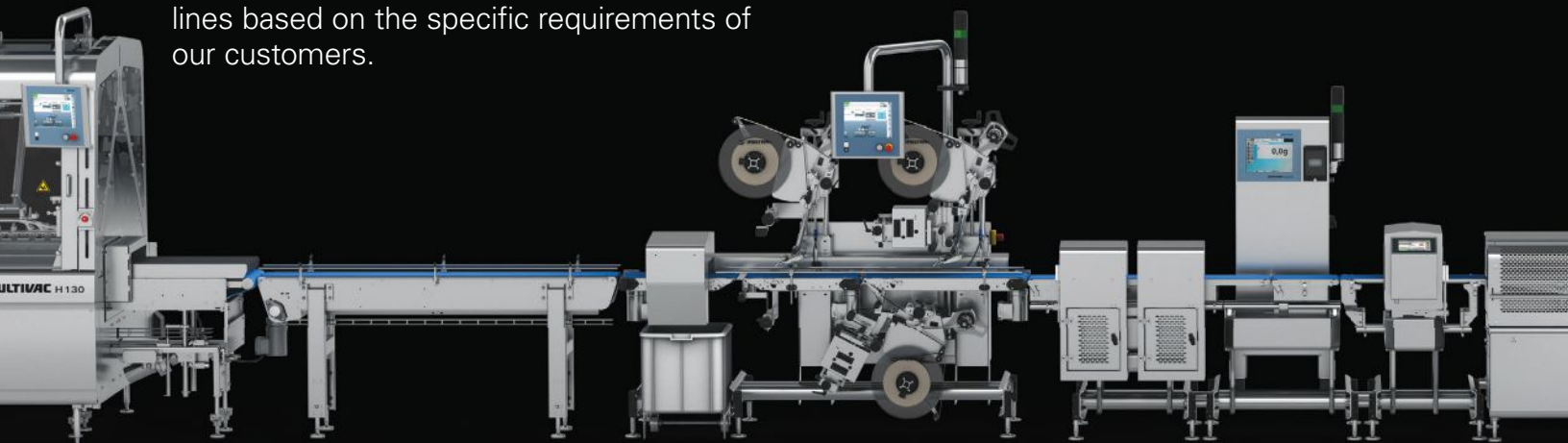
priate for the products for which it's being used. It's applied to way too many different products, and it doesn't cover all the pathogens that we're trying to control.

**Meatingplace: What types of science gaps did you find?**

SINDELAR: Once I got into that research,

I realized that there were other problems that meat and poultry establishments were having, especially with the [temperature] come-up times and the relative humidity requirements and so forth in Appendix A. My goal was to try to take each one of those components, conduct

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“You may have little bumps and hurdles along the way but when the process works, **IT'S A BEAUTIFUL THING.**”

the research, and then try to link current findings to Appendix A.

The first work that we did back in 2008 or so was basically to repeat the work that was done for the original Appendix A to cover other products, include other pathogens of concern, and then also look

at different situations. For example, what impact does nitrite or curing, or moisture content or fat, have on lethality? None of that was ever addressed in the original Appendix A.

The idea was to gather enough science-based data to fill in the gaps, connect the dots. That way, if questions were to come to me through an extension query, such as 'Is it acceptable for me to apply Appendix A to a low-fat turkey breast?' or 'Is it appropriate for me to apply Appendix A to a high-fat dry sausage?', at least we would have some baseline knowledge that it's likely yes [or] likely no. Without doing an absolutely validated study for that particular product, the answer is never absolutely yes or absolutely no, but it gives us enough sense about if it is usable for the desired application.

**Meatingplace: How did you get involved with the NAMI Appendix A & B Core Working Group?**

SINDELAR: It's a wonderful opportunity, and [UWisconsin-Madison has] a lot to bring to the table because we've been working on thermal processing research relevant to Appendix A for a long time. We have the facilities and the intellectual knowledge to support it, as well as a great

industry in the state. And all of that is kind of hinged together by the extension program. I'd say that if it weren't for the extension program, I would probably only be peripherally involved with the working group. I've only become as involved as I have because of all the work here [at UW] and my experiences with thermal processing, and ultimately my passion and interest to be impactful and to achieve.

The working group has three components: The core working group has the academics like myself, my UW-Madison colleagues Kathy Glass and Andy Milkowski, Kerri Gehring (Texas A&M), Jim Dickson [Iowa State University], Jonathan Campbell [Penn State] and Bradley Marks [Michigan State University]. It also includes a few consultants, including Bruce (Tompkin), Bob Hanson (HansonTech), Margaret Hardin (IEH Laboratories) and Peter Taormina (Etna Consulting Group). We're considered the neutral group.

And then there are the affiliates of the industry, which basically comprises microbiologists or scientists representing companies such as Tyson, Hormel, Cargill, ConAgra and so forth. And then the third is the affiliates, which is [represent-

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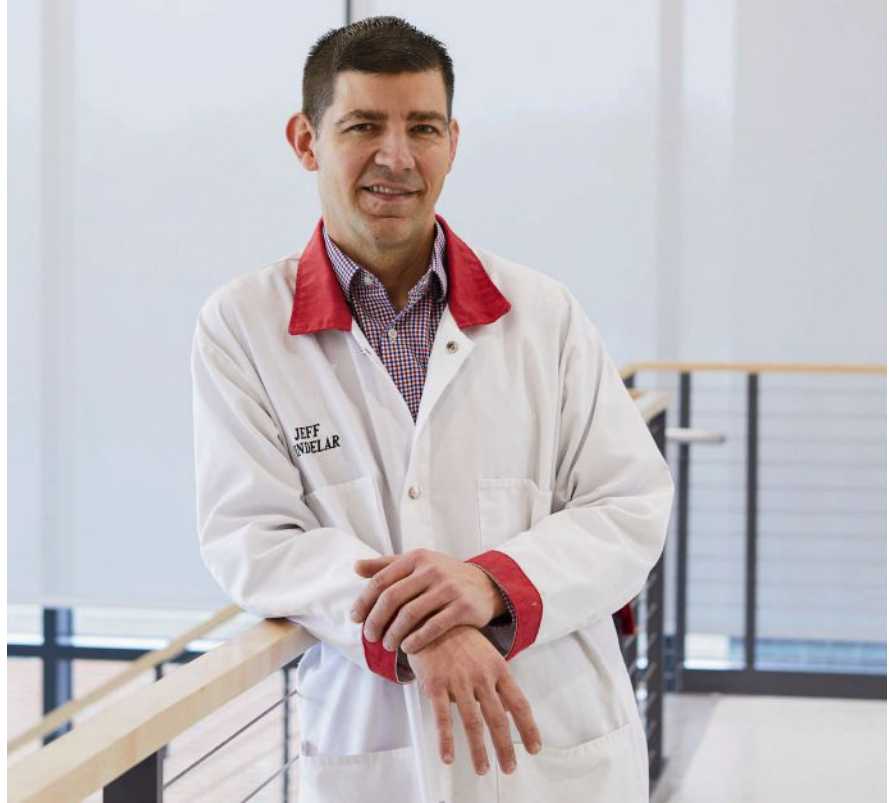
# SCIENCEprofile

tatives from] the trade associations such as NAMI, AAMP [American Association of Meat Processors] and others from the National Turkey Federation, National Cattlemen Association, the Pork Board, and so forth.

Compartmentalizing these different subgroups is what's made the working group, in my opinion. I think it's ingenious. And then using that as a means to build a good rapport and a good working relationship among all [stakeholders], because everybody has an agenda, right? Everybody has a different reason for being involved.

**Meatingplace: What's the core working group's general approach to sifting through the science supporting Appendix A & B?**

SINDELAR: The core working group is really, really important in that we're the 'neutral' subgroup, right? As I've said many times in conversations with the working group members, 'Science-based data must drive decisions.' If that comes from industry, or even an affiliate member, it doesn't mean the same thing. It is what it is. But the other two parts of the full working group — the affiliates and the industry experts — are so impactful in this process because they bring in the real world, real



life experience with using these guidelines. They know the problems and concerns and they want to be involved and engaged in finding workable solutions.

What makes it all work, in my opinion — or what has made it all work so far — is understanding who is involved, what everyone's agenda is, and then managing that. From the initial meeting two summers ago, I realized, 'Holy smokes, we have all these people in the room and they all have a different agenda, but they all are valuable. We probably need to strategically think about how we communicate, not as 'us against them' but as a 'we.'

When we went to have the first meeting with FSIS, they became part of the 'we.' When you're meeting as a 'we,' everybody has an equal voice. This is the collaborative medium [through which] progress can be made, with the scientists, the industry and the government at the same table.

We want this to be a roll-up-your-sleeves effort. There are some ground rules, but let's really talk about what the issues are in terms of the science base for Appendix A & B. Let's allow some passion, some excitement to come out, yes, but let's control it in a way that it doesn't take away from progress.

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**Meatingplace: What's the projected timeline in achieving final guidance documents?**

SINDELAR: That's a great question, and actually we were discussing this quite a bit [recently] at our UW food safety summit. The takeaway that I had from FSIS was that there are going to be a couple more versions of Appendix A & B, one coming out soon and then hopefully a final. But, the final wasn't necessarily going to be a final. It was really going to kind of be treated as a working document.

And, I think that we're all learning that for all the work that is needed to address the scientific gaps and opportunities, there will be new gaps that will emerge



in the future. And I think that's a really, really important realization. It's not going to be like HACCP, where you're constantly reassessing and changing and updating throughout the year and every year, for example.

I would like to hope that Appendix A will be updated every three to five years

maybe and that there's a mechanism so it doesn't become quite so cumbersome. But the gaps on the Appendix A side still are the cook time and relative humidity requirement for less than an hour. Slow come-up times are challenging for some of the meat, and then, of course, just the general surface lethality concerns.

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“**IT IS HOPED** that the recommendations in Appendix A & B will be a lot easier to apply and [the meat and poultry industry] will be confident that **THEY'RE VALID.**”



**Meatingplace:** What's the progress report on the new research that is underway to fill the gaps? Are you seeing any opportunities for further research?

**SINDELAR:** We've got a little bit more work to do, and unfortunately research takes time. That was another big realization the working group has had during our conversations with the agency: This is going to take a little bit of time. Our responsibility is [to] try to be as efficient and proficient as possible [and] we're making progress.

The good news is that Appendix A & B research mini-grants have been completed for research directly related to the guidance updates. Those reports have been submitted and are available from NAMI. We were doing some impingement work funded by industry, which was basically in parallel with the mini-grant that Brad Marks [professor, Michigan State University] was using and whose research has really been about thermodynamics on using fast-cook processes.

The final report for that is under final review and we're working on getting that information out to the industry, first to the companies that supported the work, and then make it available publicly, and then send it over to FSIS, so that they have that information. We're still moving



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“**WE WANT THIS TO BE A ROLL-UP-YOUR-SLEEVES EFFORT.** There are some ground rules, but let’s really talk about what the issues are in terms of the science base **FOR APPENDIX A & B.**”

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forward on this work.

As for further research, the University of Wisconsin and Michigan State University are continuing to work collaboratively on thermal processing research. Our groups have submitted another grant proposal to NAMI. We're working on a novel way to support Appendix A, specifically, thermal lethality. The first part of the proposed work is both institutions pooling all their thermal processing data, building a thermal lethality model and testing the model.

The second part of the proposed work is to develop treatments and experiments to add validity and strength to the model, because the more data and the more viable data, the stronger the model.

A third part of the proposed work is to do cross-validation. Michigan State and University of Wisconsin would do separate work, and then we would have a small portion, like a 25% overlap. Basically, it's to confirm and validate that we get the same results in different settings.

And then the fourth aspect of the research — and I will be adamant that we put some time and energy and effort into this — is to look at how we can take the work, which is primarily applied toward fast-cook products, linear ovens, etc. and translate that to other products such as hot dogs, hams, bacon, baloney and so forth.

**Meatingplace: It seems like the research is on the fast track. Is that because you want findings to be considered before final revisions are made by FSIS to the guidance documents?**

SINDELAR: We do. Both research teams are trying to work as fast as possible to get as much data generated as possible, so that

“I want to understand the needs of the industry and then figure out **WHAT IT IS THAT WE NEED TO DO TO, BOTH SCIENTIFICALLY AND PRACTICALLY.**”

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it can help strengthen the final Appendix A guidance. There's so much work to do, so we're going to continue doing that work.

Wherever a final version of Appendix A doesn't quite fit or align with the needs of establishments, we'll create other documentation or support. Maybe it's a UW thermal processing safety guidance, for example, but we'll develop and manage that so that it is available as either a supplement or as an alternative for Appendix A where that is needed.

**Meatingplace: What do you hope will be the final outcome of the Appendix A & B working group's efforts?**

**SINDELAR:** What we want to do is understand the mechanism and then generate parameters based on that mechanism, which takes science to do. If we understand the 'why,' then we can use that to create the 'how' – 'how' being, how do we move forward? And, the 'what,' meaning what does [moving forward] look like?

I would prefer to remove those ambiguous humidity options in Appendix A. We generally know why they work, but we don't know what the mechanism is. If we understand the mechanism we can then say, 'You don't need those [options] anymore, but here are the ones you can use, based on the most current science.'

Ultimately, it is hoped that the recommendations in Appendix A & B will be a lot easier to apply and [the meat and poultry industry] will be confident that they're valid.

If they're easier to apply and they're more black-and-white, they can be used for an array of different products, no matter the processing procedures or environmental conditions in which they are produced.