

What's Up with Upcycled Food? Interview with Sue Marshall of NETZRO

Interviewed by Dan Skogen on the AURI Ag Innovation News Podcast September 2023

[00:00:00] **Dan Skogen - AURI:** Hello, everyone, and welcome to the Ag Innovation News Podcast, presented by the Agricultural Utilization Research Institute of Minnesota. I'm Dan Skogen, your host for the Ag Innovation News Podcast. Guests on this program will shed light on innovations in value added agriculture, highlight important voices and work that's being done throughout the state of Minnesota ag sector, and educate the public about resources and organizations that support Minnesota agriculture.

Today, we'll be visiting with Sue Marshall, the founder and CEO of Net Zero, a leader in sustainability and the circular economy by eliminating food waste and expanding the food supply chain. Sue Marshall, welcome to Ag Innovation News Podcast

[00:00:51] **Sue Marshall - NETZRO:** Hello Dan. Excited to be with you today.

[00:00:54] **Dan Skogen - AURI:** Well, let's start with the background on you and NETZRO.

What is Net Zero? What's its mission?

[00:01:00] **Sue Marshall - NETZRO:** NetZero is a state of the art food upcycling platform, which does include proprietary equipment, which I believe we'll talk about today in more detail. And the purpose of it is to capture and convert industrial scale food waste into new upcycled ingredients. And so we'll talk about upcycled food in detail today too.

As far as the mission, you know, I am a B Corp at NETZRO, I, that was my whole vision was to be a B Corp, had that through some great role models in the state of Minnesota. So my mission, you know, really was in the beginning more of a circular type focus, even though at that time in 2015 16, it wasn't quite the vocabulary words that were being used, but I had it in my mind.

So really the mission is to create upcycled ingredients. From existing food by product streams and that would be rather than from new resources in order to expand and connect the food supply chain and then of course preserving the natural environment for the benefit of future generations. So that's lofty and I'm sure we'll get into more details today and I'm really excited.

Let's talk about Sue Marshall for just a second and what your bio looks like. What roads have you traveled on to be the founder and the CEO today of NetZero? Well, a lot of roads. When I went back to school at St. Thomas to finish my grad studies, I was considered not a traditional student because I was older.

You know, I'm, I want to say wiser. Okay. But I definitely was an older student and I didn't mind that. Cause I love young people and it's. It's been a blessing since then to stay engaged

with the University of St. Thomas and University of Minnesota and other great academic institutions for students. So it was really wonderful.

My whole life has been around learning, so it's not a surprise. I've always been an entrepreneur, mostly in real estate since I was very young. So I spent 28 years in real estate and pretty much had every kind of real estate company you can think of, and even a construction company. So I think part of me gets a little bored and then I decide to go on to the next venture and, you know, food and agriculture.

I'm from a farming family. So my father was from a farm, 14 children on that farm. So I was close to it growing up, even though he had moved us to the cities early on, but for the most part, I still had a strong connection there. So I always felt it in my heart. So people who know me personally and know my family aren't surprised that I found my way to agriculture, just in a very unique way.

[00:03:33] **Dan Skogen - AURI:** And we're going to talk about that in just a little bit. Net zero though, a leader in sustainability and the circular economy by eliminating food waste and expanding the food supply chain. Came right off your website. I think we all understand to some degree the elimination of food waste, but what's meant by sustainability in the circular economy, and in what ways do you see net zero expanding the food supply chain?

[00:03:56] **Sue Marshall - NETZRO:** So when I first came out of St. Thomas with the idea and had to pitch, I would start out with wonder if the end of the food supply chain as we think of it, which would be food waste, was actually the beginning of a whole new food revolution. And this was in 2015 and 16 and there wasn't anything. Really defined or any ecosystem called the upcycled food anything really?

So it was a little ahead of its time But it was within 24 months of that that I met a bunch of folks that were actually using upcycled food as the connection Between what we would be throwing away or under utilizing for food and then adding value to that to get that back into the human consumption and pet food consumption arena.

So AURI was, was a perfect partner for me early on because of all the work that AURI does with byproducts. So it was pretty natural in Minnesota to end up on the path that I did.

[00:04:57] **Dan Skogen - AURI:** So, in a nutshell, from a layman's standpoint, Sue, you're taking garbage and finding what's still valuable in there, capturing it, and creating an ingredient with it. Is that fair?

[00:05:08] **Sue Marshall - NETZRO:** That is fair. Absolutely.

[00:05:13] **Dan Skogen - AURI:** What an exciting way to go. Your webpage also talks about patent pending equipment and technology platforms, and I know some of that is proprietary, but what can you share with us about this equipment and the processes that you engage in that takes this food byproduct and turns it into a new sustainable food ingredient?

[00:05:29] **Sue Marshall - NETZRO:** It's been an interesting adventure on the equipment side. Some of it isn't new as far as dehydration. So we all understand dehydrating food. We understand traditional drying methods. And so there's a lot out there doing those things. What we learned early on, if our goal was as lofty as human consumption, you have to look at it from a ready to eat perspective.

So whatever we do to take those food products, We have to make sure we have a kill step. So we kill anything that we shouldn't be consuming, of course, and then we stabilize it for a shelf perspective. Because if you can't have shelf stability in the volumes that we're looking and we deal with, we really can't preserve that.

Then to be going back into food. So really the key is, how do you get that safe conversion? And then how do you get the stabilization from a food safety perspective? And then the science of it is, of course, as you mentioned, getting the value out of that food. There's still proteins, there's vitamins, there's other minerals and nutrients in there.

And so there's all kinds of methods once you safely convert it and stabilize it. There is great science going on today on extracting certain nutrients. So net zero's really goal is just to take those quantities. And get them safe and then get them stable.

[00:06:53] **Dan Skogen - AURI:** Before we talk about your partners, Sue, when you talk about that process, I think about the supply chain for you.

How do you guarantee or where are you finding your original product? And the trash or the wasted, the byproduct food that's being turned out. Has that been difficult to locate and capture?

[00:07:11] **Sue Marshall - NETZRO:** Well, my adventure was fun. Last semester of school back in 2014, one of my initiatives was to go to Iowa. They have a location in Cedar Rapids called C Street.

And on C Street is all the popular food manufacturers that we know, whether it's Campbell's and vegetable soups, meats, eggs, all of the things that you and I have on a daily basis as a consumer good, basically exists on C Street. So I was doing some touring and some surveying of those manufacturers all around what kind of food waste did they have coming out of the plant once they made their products.

So once I dove into that, it became endless to find the food waste streams and the byproducts. And then now the question was, what were we going to go to market with and why?

[00:08:04] **Dan Skogen - AURI:** And when you talk about equipment and technology platforms, I would guess there are other companies or organizations that are very curious, if not interested, in participating with you.

[00:08:14] **Sue Marshall - NETZRO:** Yeah, it's been a great journey. Uh, there's a lot of technologies out there. One thing that we were able to carve out Was the upcycled food space. So there are other technologies that, you know, reach out to us that are complimentary.

A lot of people might think it's competitive, but it really is not. We have a really unique space with the idea of having the kill step and the stabilization all in one step.

Then after that, there's all kinds of different refinement equipment. There's pretreatment, post treatment, dewatering. So really we became this. Go to a space where then we can look at the different manufacturing plants and the different byproduct streams and kind of put together the various equipments that would be needed, including, you know, of course, our proprietary equipment, which we think has a wide distribution because it is agnostic to byproduct streams.

It pretty does, does a dang good job on most byproduct streams.

[00:09:11] **Dan Skogen - AURI:** So you can kind of franchise it if organizations or companies want to set one up in their backyard, you can help them get there?

[00:09:18] **Sue Marshall - NETZRO:** Yeah, in fact, we're finding interest. We did our first licensing deal in Ireland. The international ecosystem, they do a lot of drying, they do dehydrating, they're actually very forward.

Not putting food in landfills. And it does make sense because they don't have the real estate to have landfills like we do here in the U S. So they tend to be more forward on capturing the value. They just need innovation. So United States are known for innovation. So it's not a surprise that they come looking for it here and then have been on our doorstep and we're doing a lot of great work with the various, you know, Europe, Asia, to see what they've been doing and how our technology can fit into some of the things they're doing.

[00:10:01] **Dan Skogen - AURI:** Behind the curtain at EURI, I have heard whispers of something like the Tyson Accelerator. Is this what we're talking about? These kinds of things?

[00:10:08] **Sue Marshall - NETZRO:** Yeah, Tyson is one, you know, they're a global company. My personal view in the last 24 months, you know, there's COVID. So I believe COVID changed all of our views on the supply chain, right?

So we all suffered in some way on the supply chain, big companies as well. So they started really getting serious about it. And then of course, the last 24 months, there's been obviously the focus on environmental. So, of course, the U N. and lots of things going around with climate change in the U. S.,

there's becoming a wider movement on acceptance of climate change and the effects that we have. And a lot of that can roll back to greenhouse gas emission. And then if you roll back another layer, a lot of that has to do with food waste. So now that big companies like Tyson are looking at this and they clearly are in a position to have a lot of food byproducts and then be in a position to add value to that and then to put that back into human consumption in their consumer packaged goods side of their business.

[00:11:07] **Dan Skogen - AURI:** Well, Sue, as you know, innovators, entrepreneurs, and startups don't often succeed in a vacuum. So, who are you partnering with that you can talk about?

[00:11:16] **Sue Marshall - NETZRO:** I'm really excited since probably the last 12 months to see a lot of interest from economic developments. AURI does a great job with economic development people, too, and I've met a lot of people in Minnesota through that route.

Across the country in the U. S., a lot of economic development activities, and of course, that's tied to the government. I do think that the infrastructure bill, there's funds coming out, and then of course, the American Recovery Act, that's all focused on food waste. So this past 12 months, there's been a lot of flurry going on into initiatives to really look at what is the low hanging fruit, byproduct fruit, which is a good one.

And then what can we do to really make a difference and get some pilot projects going. Tyson, you know, that that's one, but there's a lot of big companies that have resources, food science, food engineers that can help net zero and other entrepreneurs in this space really accelerate. Sue,

[00:12:13] **Dan Skogen - AURI:** are you looking for more partners? And if you are, who makes a good partner for you?

[00:12:16] **Sue Marshall - NETZRO:** The most recent one we're stumbling on that we're excited about are waste management companies. That's a space that I think was hard to imagine that there would be interest there. But if you peel back what they do, they're transportation and logistic professionals.

And when you're talking about tons of byproducts coming out of a facility that used to be transported to Perhaps land application initiatives, uh, worst case landfills. Those folks want to play and they really want to look at how they can be part of the solution to add additional value, to get the byproducts into a position of consuming.

[00:13:00] **Dan Skogen - AURI:** We want to come back and talk about some success stories that they've had, what these ingredients are being used for as they are recycled, and some more about what's happening with Net Zero, of course. And we're going to do that, but just wanted to remind our listeners that they're listening to the Ag Innovation News Podcast, and we're visiting with Sue Marshall.

Sue is the founder and CEO of Net Zero, a leader in sustainability and the circular economy, eliminating food waste and expanding the food supply chain. So Sue, let's talk success stories that you can share. And I guess one question I want to make sure our listeners understand is your work beyond that tabletop prototype, you're out in the marketplace now, or where are you at in development?

[00:13:38] **Sue Marshall - NETZRO:** I had great support initially on lab size version of the equipment. So I got into it right away, working with small quantities, and then I got really. Lucky to be sponsored by Udipul's Brewing in Minneapolis to build a commercial grade

sized of equipment that would handle a medium sized brewery. So we built that and then from there we got hosted by a large distilling company called Tattersall.

Their amount of upcycled grain potential was three to four times that of Oedipal's at the time. So it allowed us to really take a look at scaling the technology commercially. And then this year we just began selling commercial equipment. And I've had a lot of food companies that were mentoring early on and giving me insight as to what this equipment actually eventually had to do.

And one of the things besides food safe, which is obvious was return on investment. You know, these things have to operate from an economic financial feasibility perspective. So I've had a lot of great engineering help. I have a great team currently that is looking at how do you make it more efficient?

How do you make it user friendly so anybody can turn it on and then how do you make it actually make money for the company using the equipment.

[00:14:58] **Dan Skogen - AURI:** Sue, I think I just want to clarify for our listeners today about what Net Zero is involved in. Because I hear you talking about equipment, and I hear you talking about ingredients that are available through the upcycled food.

Is Net Zero selling equipment? Or are they selling ingredients? Or are they selling a whole package?

[00:15:15] **Sue Marshall - NETZRO:** Great question, Dan. And yes, we're selling equipment. Yes, we're selling ingredients and the whole package right now. So really, our model is to sell the platform, which includes the equipment, the data necessary to be able to sell the food safe upcycled ingredients.

And then help them sell the ingredients if they need help. We just started it this year selling the equipment. We had to make sure it was perfectly designed and intuitive for somebody to run. So that did take a couple years, but we're ready. We have a couple contracts and we're pursuing more people for contracts this year for the equipment that includes the data.

In most cases, they, they really prefer to have help selling the ingredients. And that's rightfully so. For example, in a brewery. They make beer. And quite frankly, I want them to keep making beer and not worry about the upcycled ingredients. So we do help when they need help to sell the ingredient.

[00:16:09] **Dan Skogen - AURI:** So when you have a client or a company or an organization that takes on that whole package, they have the equipment, they're also harvesting the ingredients and they're using those or selling them to someone else.

Do they get a real advantage in the marketplace? Do you think?

[00:16:23] **Sue Marshall - NETZRO:** Well, if you think about what they're probably doing today is not adding enough value to those byproducts to bring in some significant revenue,

they might maybe wash the expense a little bit by maybe getting it to some farmers, you know, expenses of getting rid of it, logistics, transportation is getting more and more expensive.

So most of the calls we get is really on trying to figure out how to eliminate the expense. Once they realize they can actually make money. It tends to bring the CFO into the conversation because it's just been one of those things they haven't thought enough about actually making revenue, but it's great to be in a position to not only show them that they can eliminate the expense they currently have for getting rid of it, but also add value to make it a revenue stream.

[00:17:10] **Dan Skogen - AURI:** This sounds like the exciting piece, Sue, because NetZero is working on something that is truly disruptive or game changing in the ingredients world. Can you expound on that a little bit? Or am I reading it wrong?

[00:17:22] **Sue Marshall - NETZRO:** You're reading it exactly right, Dan. And to be honest, the investor world is starting to really circle because of the, they call it, there's a new name for it in their world, it's called Equipment as a Service Model.

So, they look at it as if... If you have equipment that can actually make money, that gives that risk of that investment to go down quite a bit. And of course, add to the IRR, obviously rate of return over time. So I just happened to get lucky putting all net zero together and the model together the last few years to be in a position where now it's something that's actually looked at from an investor perspective as, as the new trend all along, we knew we would end up.

financing equipment for people. And we thought about it like the solar industry where not everybody could be early adopters to solar panels because of the expense of it. But as soon as financing became available and it was easy to actually have solar panels attached to your building or even your home by signing on the dotted line, and you could look at your ROI and know that that capital costs would be covered in a short period of time.

Then the industry took off. So we're looking at it at the same way.

[00:18:38] **Dan Skogen - AURI:** Sue, I know you as an entrepreneur, and I also know that in the early days, you were really a lone wolf and working on your own, but Net Zero has really become a team effort now, and tell me a little bit more about your team.

[00:18:50] **Sue Marshall - NETZRO:** I love our team. We have partners like AURI, so I do want to mention that, you know, obviously I was a lone wolf, but AURI obviously was doing by product valorization. And so I wasn't completely alone in the entrepreneurship world. Possibly, but then that soon changed too. And then as soon as the upcycled movement started for these ingredients, then it became really easy for me to recruit people, whether it was to work for me, to help found the model itself.

We have such a great team that came in and helped. Today, I have one of the best CSTOs I can get, 38 years at General Mills overseeing technology and innovation, Craig Dowd, and

several other people on the board. I have someone who oversaw Coors supply chain and spent grain. So over the last three or four years, people have been coming to me.

Looking at this, like you said, disruptive way of looking at what typically was considered waste, knowing there's value there, and then wanting to be part of it. So it's all timing. And of course, we've got big challenging problems to take care of with food waste and food justice and access and environment and all these things.

So to me, it's like everything came in line at the same time. And that's when disruption can happen. So it's just an exciting time to have so many great people coming forward to want to be part of it.

[00:20:11] **Dan Skogen - AURI:** Would you say NETZRO's successful or if it isn't yet, what does success look like?

[00:20:17] **Sue Marshall - NETZRO:** I believe we're successful in getting the movement noticed and tipped.

Like you said, I'm alone thinking of what am I just think being crazy, but you get to a point where you have more people understanding than not understanding coming to the line to help. I feel like that's success just in itself. I think that net zeros funding, we have to get funding to scale. So I'm always looking at net zero directly.

Soon as I get as much equipment out there as possible to handle this for the food and beverage manufacturers that are out there that need help. As soon as that is going well, then I will say it's time for Sue Marshall to perhaps. Participate in a different place in the industry. And since it's a new industry, there'll be plenty of places for me individually to play.

But we still have a lot of work left to do to get this out into the hands of all kinds of people.

[00:21:12] **Dan Skogen - AURI:** And Sue, when you achieve that success, what do you think it'll mean to agriculture and to those who produce the world's food?

[00:21:20] **Sue Marshall - NETZRO:** This was the line that got me inspired in the beginning several years ago, was wonder if the end of the food supply chain, as we think of it, is actually the beginning of a food revolution.

And that really means economics. It means food justice. It means resiliency in the food supply chain. A lot of these things would have been really hard to get quickly together if it wasn't for COVID. So in my personal world, I feel it was a COVID benefit if we have any at all out of that experience. I would like to say that food upcycling became a thing and the whole idea to keep local and keep that local food supply chain strong.

And we can't do that without looking at the wastefulness within that. So at the end of the day, I think it's timing. I think the food upcycling movement was right on the tails of any other kind of recycling movement. It just got accelerated and part of it was COVID. I'd like to think it still would have happened, but it probably would have been a few years yet.

[00:22:20] **Dan Skogen - AURI:** I just have to keep pointing back to the fact that any success that you have keeps it out of the landfill.

[00:22:27] **Sue Marshall - NETZRO:** Absolutely, right? Anything we do to value it and keep it out of a landfill, whether that's soil amendments, whether that's feed for animals and doing a better job doing that. And then ultimately, can we make this about consumption?

And that's why I'm really excited about California's SB 1383 regulation being signed, because not only does that divert from the landfill any food, but if you read into the couple lines down, it says 20 percent of that diversion, of that food being diverted from the landfill, must be human consumption.

So what that does is it makes that bar even higher for us to say, What is the low hanging food waste in this case that could actually be diverted early on to get into the tummies of people and that's bold and what they did is bold, but I also know that California tends to be first in some of these things that we face.

And so Minnesota, I'm super excited because I know they got a lot of money put aside for food waste and they're deploying it, looking at byproducts. coming out of food and beverage manufacturing in this state of Minnesota. So I know once this starts getting across the country, regulations being put in place, I know that people are going to start really coming to the line to do some good work.

[00:23:49] **Dan Skogen - AURI:** And as you're successful, what do you think that means for the consumer or the end user?

[00:23:54] **Sue Marshall - NETZRO:** Well, I would love to think that it makes better food because of the nutrients that we're utilizing instead of throwing away. I would like to think that greenhouse gas emission can be almost eliminated, for sure eliminated, out of landfills.

And so that's a better environment. And I would like to say that there's more food, better access to everyone. And when I started this work, I said, you know, I'm not... into this food upcycling, just the high end niche specialty crackers that have upcycled ingredients. I went at it as, I'm going to make this a commodity.

I'm going to make this food available for all types of products, not just high end niche products. I want to see cereals that are available to everybody. I want to see bakery goods that are available to everybody. And that's Really hard because that means the engineering and the efficiency and the processing all has to be better and better and better.

And our team is focused on making that a reality in the next few years so everybody can access upcycled ingredients.

[00:24:56] **Dan Skogen - AURI:** It may be too soon in the question and answer part of the day, but what's the next big thing that we should be looking for from net zero?

[00:25:03] **Sue Marshall - NETZRO:** I believe this next year will be big in California with the SB 1383.

And I do believe you'll start to see a lot of, I do every day, more people coming to the line on offering their advisory skills. There's a lot of people coming out of some great food companies, Cargill, General Mills. I've experienced them coming to me wanting to be part of this great work and, and finish their careers doing some great work.

And then young people coming out of university. I get them all the time. Really wanting to go forward on how can we make the food system stronger, more resilient and safer to the environment. And upcycling food is just one of those easy categories for them to grab onto. So you're going to see Net Zero involved in some really great projects in California.

You're going to see some big companies that really are starting to deploy resources to this great work. And in Minnesota, you're going to see some great things going on, too, at the state level and then locally. So, you'll see all of that in the next few months, and some of it I can't talk too much about, but it'll be exciting to watch.

[00:26:09] **Dan Skogen - AURI:** Early stages, though, Sue. What keeps you up at night?

[00:26:11] **Sue Marshall - NETZRO:** I look at what's happening with climate change and, and what the young people have to deal with. And I, I really think that if I just could have a couple more hours every day, so I can do even more work. And it's exciting because my kids are at the point now in their careers, where they're starting to embrace and do some great work.

And that's been fun. So if I had more hours in the day, I would even do more work with them, to help them in the food, food world, because all of my kids do play in the food world in some place. What keeps me up at night is work, but it's good work, and I'm excited about it. Sue, you've

[00:26:45] **Dan Skogen - AURI:** shared a great story with us today, and I just want to get your final thoughts on Network's impact, the upcycled food movement, or anything you want to leave the people with today during this podcast.

What do you want to leave them with?

[00:26:57] **Sue Marshall - NETZRO:** Well, I would like to leave them with keep an eye on policy, look at, you know, your politicians locally and see what kind of work they can do to get some of this innovation and technology and some funding for it, because I can tell you it is there in addition to net zeros.

Great work on technology. There is several great technologies out there to recover food. water to do better work. We just need politicians and policy to help support that work. So that would be what I'd like to leave people is check in with your local economic development teams. They tend to know what's going on and then participate as much as you can.

[00:27:33] **Dan Skogen - AURI:** And if people are looking for just more information, where's a good source?

[00:27:37] **Sue Marshall - NETZRO:** They can go to our website, which is www.netzro.us and then the www.upcycledfood.org if they want to look at the certification and other general trends in the industry.

[00:27:50] **Dan Skogen - AURI:** We've been visiting with the founder and CEO of Net Zero, Sue Marshall.

Sue, I want to thank you for spending some time with us today and best of luck as you move forward.

[00:27:58] **Sue Marshall - NETZRO:** Thank you, Dan. Have a great day.

[00:28:01] **Dan Skogen - AURI:** And thank you, our listeners, for joining us today and listening to the Ag Innovation News Podcast presented by the Agricultural Utilization Research Institute of Minnesota.

I want to thank my podcast crew of one, Lisa Martinez, AURI communications coordinator and the editor of this production. To learn more about AURI and the work that we're involved with, you can visit www.auri.org.