DDGS for Stockers Episodes 1 & 2

Dana Zook: [00:00:00] Welcome back to the extension experience podcast. I'm Dana Zook. I am recording on campus this week in the animal science department. And I'm joined by Dr. Paul Beck, one of our OSU Beef Extension Specialists.

Paul, thanks for joining me today.

Dr. Paul Beck: Thank you for inviting me, Dana.

Dana Zook: Yeah, I, I got Paul early this morning to talk about a new supplement that has become available across the state. In a conventional supplement lineup. So we're seeing it on the board at the, at the feed store along with your 20 percent cubes, your 37s, it is a distiller's grain cake or cubes.

And so it's been available in this new format for about five years. Distiller's grains with solubles. So listeners will refer to them as DDGs but that's what it. it refers to is dried distiller's grains with solubles and Paul's gonna help us define what this product is. So it's been available for about five years Paul.

I've dealt with it being from Nebraska really since I started a school at [00:01:00] Nebraska, but this, this form That it's provided in as a cube or an extruded cube. That's kind of a new thing. So, could you tell listeners a little bit about what distiller's grains actually is?

Dr. Paul Beck: Well, distiller's grains have been around for hundreds of years coming from the ethanol industry.

Usually we associate that or we used to associate that only with whiskey production or other libations of that sort. Right. They were just a locally available product in most cases very highly available, in the Kentucky region Tennessee those types of areas where there's a concentration of drinking whiskey production.

In the 90s There's really a big increase in the production of ethanol for fuel. Huge industrial complexes put together for that. And they put those where the corn is. So as you said, in [00:02:00] Nebraska it's very highly available. So the, the distiller's grains with solubles. is what's left over after the fermentation process, the distilling process where most of the starch is removed from the corn.

They process the corn. It goes through their distilling process. It uses up a, a lot of the starch that's in there. All the other ingredients the protein, The fiber, the fat because we're removing the starch, all those increase in concentration. And also there's some spent yeast and some other products that get wind up in there.

Knowing the process that is being used they're working that process to create the most ethanol they can. So it's not uniform. from batch to batch. They're, using their technology to create ethanol as their [00:03:00] primary product. So there may be more or less sulfur from the sulfuric acid that they use to halt the fermentation process at a certain point.

You know, there's just different variables that go into that. Most of what we see in Oklahoma especially as we get out of the panhandle of Oklahoma into the main part of Oklahoma, would be a dried distiller's grains in the feedlots in the panhandle. There are some modified or wet distillers that make it into those feed rations.

And the shelf life of the modified which is about 50 percent moisture. Would be longer than a wet distiller's, which is about 30 percent dry matter which would only keep for, you know, just a few days, so you have to have these truckloads turned over quite a lot, and we're hauling a lot of water, and that's why we don't transport those long distances into most of Oklahoma, and that's why we see [00:04:00] where to expand their

customer base, they dry those down to about a 90 percent dry matter or 10 percent moisture basis. So, what we get as the dried distiller's grains with solubles is a yellow to slightly dark brown powder that's fairly small in, in particle size. And that leads to some problems when we're feeding it in range conditions.

Pretty much, my, my thought is you have to use a feed bunk or else you're going to lose a lot feeding it on the ground, especially in really sandy areas. But, you know, they'll, they, they will lick it off the ground quite a bit. But I've seen, 10 to 25 percent loss estimations trying to feed it on the ground

in a loose format. Also, it's, really easily blown by the wind, [00:05:00] so as we get into western Oklahoma, we have sand and we have wind, so, it will just blow away as we're pouring it out of the bag. So these cubes historically, the, the regular cubing process does not do a very effective job of making a really nice cube.

were a very stable cube, hard cube to feed. They wind up breaking up and causing a lot of fines and, and really not a very good quality product. So, about six years ago, there's some companies that started extruding distillers cubes and using an extruding process kind of out of the plastics industry.

So they took this technology started using it with these cubes, and they make a really nice, stable product. One of the first conversations we had with the owner of one of the first companies, Master Hand Milling, that had a facility in [00:06:00] Lexington, Nebraska. He said that, they think they're seeing an increase in protein, increase in energy.

and an increase in fat content as they go through this extrusion process.

Dana Zook: Like the availability of those components?

Dr. Paul Beck: The measurable content of it.

Dana Zook: Okay.

Dr. Paul Beck: And the group of nutritionists here at OSU, we were That's a head scratcher.

Dana Zook: Yeah, I know. I'm scratching my head right now.

Dr. Paul Beck: So one of the first things, and, and he was interested in sponsoring some research, providing some product. So I had a graduate student come to me out of Texas A& M, Jordan Adams, and one of her first projects was to take some loose distillers that were going into their process and then from the same lot of distillers as closely as we could, could get get the cubes coming out at the end of the process.

We [00:07:00] did this over several days and, and different , times, day and night, and we collected all their, their pressures and, and temperatures and, and stuff at their processing facility. And we did find a slight increase in crude protein. From thirty three up to about thirty four percent.

Dana Zook: Okay.

Dr. Paul Beck: A increase of about one percent in fat from right at eight percent to right at nine percent.

Dana Zook: Okay.

Dr. Paul Beck: And a decrease in fiber levels.

Dana Zook: Alright, Paul, you're going to have to explain this. I don't know how that's possible.

Dr. Paul Beck: And so when we calculated our TDN, our total digestible nutrients from that, It went up from 90 percent TDN to 93 percent TDN.

Dana Zook (2): Okay.

Dr. Paul Beck: We dug through some literature and there's some work out of Brazil and in China where they're using low quality products and using pressure and heat through [00:08:00] a explosive air decompression chamber. But you know, What they're doing is applying pressure and heat to these low quality products and increasing the digestibility, decreasing the fiber, and essentially the heat and pressure combination disrupted the, the NDF so that we think is what's happening with this extrusion process because It is a process where they're not applying heat, but the creation of that high pressure as it's going through that extruder increases the temperature of, of that product.

So we feel that's why we're seeing actual increases in the nutrient composition of the distillers. after the process.

Dana Zook: Very cool.

Dr. Paul Beck: It's a really neat process. Yeah. And it makes a very stable cube. And we, so we feel [00:09:00] when we're feeding it to cattle on pasture this really increases the suitability for feeding cattle and especially large pastures situations where we may want to change grazing distributions to different areas of the field.

Okay. We don't want to On a range situation, bring cattle to the same place and feed necessarily every time. In a bunk, you're saying? In a bunk, yeah. Yeah, you don't want

Dana Zook: to bring them. But that does cause some disruption to the grasses and that sort of thing in that area. Yeah,

Dr. Paul Beck: so, you know, if we have our water in our feed bunks and everything right there, we can always, you can do it visually or you can, , go

and evaluate the species and there's a Just a range, where you, have a very degraded range, composition very close to the water in the feed source where it gets, and it gets better as you get away.

That just shows they're over utilizing right there where you're feeding. in underutilizing areas away.

Dana Zook: So, listeners, if [00:10:00] you heard Paul say NDF, that's neutral detergent fiber, that affects our digestibility.

So high levels of NDF mean it's less digestible, and so by reducing the NDF Then it's more available to that animal digest pretty easily. So just a definition there, but yeah, especially native grasses, native short grass prairies, that's what we've seen in several areas of where you've done your research really affected by, trampling overuse in those feeding areas.

So tell us a little bit about some of those specific studies and where you've done them in Oklahoma and what you've. as far as performance of these calves, and you're using mostly stockers, right? Yeah, mostly stocker cattle

Dr. Paul Beck: on, on these research projects. And I know there's a lot of this being fed to cows.

Oh, yes. I've got some thoughts on, on utilizing that. Okay. So the second trial we did with, with Jordan was actually measuring how much reduction in intake we would get as we increase. Supplementation level. We had [00:11:00] some heifers here at Stillwater. We individually supplemented daily from non supplemented point two percent of body weight 0. 6 percent of body weight, all the way up to 1 percent of body weight. As we increased our supplementation rate for every 1 percent increase in supplementation, we decreased hay intake. This was a moderate quality Bermuda grass hay at this trial. We decreased that by one point six percent of body weight. That equates to about half a pound. for each pound increase in supplement rate. And so we didn't see a positive associative effect with this Bermudagrass. It's, you know, 10 percent crude protein Bermudagrass. So we wouldn't expect to see an increase in hay [00:12:00] intake at that first level where we're correcting some crude protein deficiencies.

Oftentimes with very low quality hay.

Very low quality range in like dormant native range. It's low in protein. We'll see as we add crude protein supplement, that first one, that first level pound or

two a day we see a , increase in forage intake and an increase in total intake and increase in digestibility.

Whenever we get into, forages that are over 7 percent crude protein, we don't see those positive associative effects. So we tend more to replace

Dana Zook: Replace forage. Forage intake

Dr. Paul Beck: with, with supplement as we increase supplement level.

Dana Zook: Okay, so that's what you're saying . That moderate quality Bermuda wasn't probably the best, maybe, forage to apply to that first, trial.

Dr. Paul Beck: So, it wasn't the best to try to [00:13:00] find a positive associative effect on hay intake. This was a model for us to use for subsequent trials where we're looking at feeding the supplement to cattle on green and growing

forages.

Alright.

So we did a series of stalker cattle trials growing trials at Haskell at the Eastern Research Station on Bermuda grass and at Fort Supply at the USDA range Research Station. In the Rolling Sandhills up there north of Woodward, and also at the Klemme Range Research Station at Bessie, Oklahoma, there south of Clinton.

So we pretty much, you know, covered the state with, with the extreme differences in forages that we see across the state with these supplement [00:14:00] trials. The

Bermuda grass and tall fescue blend at Haskell there south of Tulsa was extremely well managed, We looked at a fertilized pasture with no supplement, a fertilized pasture with two pounds of supplement per day, and then a higher rate of supplement. 0. 75 percent body weight, which would be about four pounds for a, five or six hundred pound calf to replace the synthetic fertilizer.

So it was unfertilized, but we had a higher supplementation rate.

We saw a really nice increase in performance.

With those, that Bermuda grass was from about 15 percent crude protein in the early summer down to about 12.

Dana Zook: So still really good.

Dr. Paul Beck: Really good.

Dana Zook: Yeah.

Dr. Paul Beck: And we still saw [00:15:00] a gain response with these cubes. Okay. Bermudagrass and Tall Fescue at that time of year are notoriously low in energy.

Dana Zook: Yes.

Dr. Paul Beck: So, you know, the, the calves on no supplement gained 1. 7 pounds a day in the early summer and a little bit less than 1. 5 pounds per day in the late summer. We boosted those gains up to close to three pounds per day.

Dana Zook: Oh, wow. That's great. Just with that small package supplement.

Dr. Paul Beck: Yeah.

Dana Zook: So it's kind of like, is it kind of like the green gold program?

I mean, that's kind of what we're doing here.

Dr. Paul Beck: It would be very similar. Okay. Now these supplements, they don't, as a rule, don't blend a whole lot of minerals in with it. Okay. Or, or ionophores or anything. So in all these trials we had a stocker style supplement with rumensin or Bovatec offered free choice to all cattle in, in all treatments.

So this is [00:16:00] above any response we would see from the Ionophore. The even with that nice gain response, the supplemental efficiency pound of, of Increased gain per pound per pound of supplement offered. Mm-hmm . Was still close to four and a half or five. Okay. So what we would expect to see from offering an energy supplement to cattle grazing.

Dana Zook: Okay. So kind of a typical response is what? Typical

Dr. Paul Beck: response for those types of, of forages.

Dana Zook: Okay.

Dr. Paul Beck: As we moved into Western Oklahoma, we did some trials where we looked at an increase in supplementation rate from zero two pounds a day, four pounds a day, or six pounds a day at Fort Supply.

Okay. Or zero two and four at Bessie.

Dana Zook: So what time of year was this, Paul? This

Dr. Paul Beck: was during the summer. During the summer. Okay. That's what I was thinking. Starting in May and [00:17:00] ending in October. Okay. For these grazing trials.

Dana Zook: Okay.

Dr. Paul Beck: And what we found with, with that was, as you'd expect a nice increase in gain as we increased our supplementation rates a marginal reduction in As we added more supplement, we may have seen a marginal decrease in, in response.

So our most efficient response in most cases was in the lower supplement rates. And during the, we expect to see a really nice response in the late summer with those forages. But we saw about the same response in the early summer as we did the late summer.

Interesting.

Dr. Paul Beck: In, in those. So and range for me is fairly hard to sample and get the estimated diet selected.

Right. The quality of that. Native range. Yeah. Because it can be variable. Lots of species. [00:18:00] are very selective in how they graze, and we just can't be that selective. Right. We don't know

Dana Zook: what they like as much.

Dr. Paul Beck: Right. Absolutely. So, you know, our sampling showed,, fairly low crude protein content even in the spring, early summer and fairly low crude protein content of those forages.

The, the cattle on no supplement actually gained fairly well in the early summer, about 1. 7.

Dana Zook: Okay.

Dr. Paul Beck: And whenever we fed the lower rates of supplement, for the most part, we saw the supplemental efficiency to be. Right at 2 to 3 pounds of supplement per pound of added gain. So, a very efficient response at those lower rates.

And you know, I'd say for the most part we did these trials over two years in two locations. [00:19:00] And, with the types of years we had, early summer and late summer, the responses may not have been, you know, exactly the same, but we did see some really nice responses to that supplement.

This is where Episode 2 Starts…

Dana Zook: With the higher level of supplement in Western Oklahoma, that six pounds, do you feel like you could have increased stocking rate a little bit with that? I mean, I'm just curious, because that's a lot of supplement for a calf.

Dr. Paul Beck: Yeah. And, and so that goes back to that first trial we did where we did.

Did see a decrease in hay, or hay intake as we added supplement. The other trials we, we did, we did two more years of studies where it was more similar to those first studies at Haskell where instead of replacing fertilizer, we had a at Fort Supply we had a negative control.

Dana Zook: And explain what that is.

Paul

Dr. Paul Beck: non supplemented. Okay. That was stocked at five acres per steer Okay. Through the [00:20:00] summer.

Dana Zook: Okay.

Dr. Paul Beck: Then we had a positive control where we essentially mirrored the Oklahoma Super Gold program with no supplement in the early summer supplementing only in the late summer at 2.5 pounds of supplement per day.

Okay. Which we fed three days a week. But it was prorated out, so equal to two and a half pounds of supplement a day. And then, we fed all summer 75 percent of body weight with an increased stocking rate. At Bessie, our supplement rates were six acres per steer for our normal stocking rate. And we increased that up to four acres per steer, or one third increase in stocking rate.

At Fort Supply, we went from five to three and a half acres per steer. So, about a thirty per one third increase in stocking [00:21:00] rate.

With a fairly high supplement rate. Okay. Four or five pounds per day.

Dana Zook: Yeah.

Dr. Paul Beck: What we found there with that higher supplement rate, but higher stocking rate, we increased animal performance especially during the early summer.

We saw a, a really nice gain response from about one seven for the controls to about two and a half pounds per day. In some cases we saw a full pound per day increase in in, in those gains. So really nice gain response, about two and a half to three pounds of supplement per pound of added gain.

Okay.

Dr. Paul Beck: And then in the late summer we saw an increase when we started feeding that supplement to the, the positive controls. So they gained about the same as the cattle that were. Stocked higher. But you know, we, we had them stocked higher and we were feeding a higher amount of supplement. But,

Dana Zook: so your animal performance per acre was [00:22:00] probably higher. Maybe not on the individual animal basis.

Dr. Paul Beck: Yeah, in our calculations we essentially doubled. Okay. Our animal body weight per gain per acre. Okay. And, using just some simple enterprise,, partial budgeting, you know I'm going to have to bring in some Scott Clawson or somebody from the economy.

Yeah, we're

Dana Zook: not

Dr. Paul Beck: doing that today, Paul. Increase profitability by about three times compared to a negative control. ,

Dana Zook: and preserving the native grass or the grass sort of basis. We're not, we're not going out there and treating this native grass and making it look like a golf course when we're done.

Right, Paul? We're still, with the supplement, we're still preserving that.

Dr. Paul Beck: Yeah, because we're decreasing that.

And you know, it's, people wouldn't say that was lucky, but for this case, I considered it to be fairly lucky on those trials. We had one year that was, we would consider to be a normal [00:23:00] rainfall year, and the next year was, was a fairly dry, kind of droughty year. And we saw the same response.

Dana Zook: Interesting.

Wow, that's great.

Dr. Paul Beck: So, you know you know, we try to do these things where we can reflect what's going to happen, you know, over, over multiple years, multiple different conditions. So, most of us don't think a drought year is, is fortunate, but for this research and for the applicability of it you know, we feel it was Really nice to see the same gain response, , essentially the same productivity from, from those supplement treatments.

Dana Zook: That's great because honestly, Paul, it feels like a drought is more normal than not anymore.

Dry periods get drier. The periods of dryness are drier, which sounds kind of weird, but it just seems like it. It's more extreme. And so this might be a risk management tool. And so do you think. That other, [00:24:00] like, higher protein supplements, I mean, you use the Oklahoma Gold program, you feel like you're gonna, it will do a similar methodology by just providing a small package protein supplement, boosting a little bit of gain.

Do you feel like that is similar , with other supplements, Paul, that producers may see if they don't see this distillers in there?

Dr. Paul Beck: Yeah, I You know, it's 34 percent crude protein product is what we're, on a dry matter basis. The Oklahoma Super Gold Program was based on a 25 percent cube fed at two and a half pounds per day.

I look at it as somewhat replacement for the Super Gold cubes. Most of us have gone to, to using a mid protein supplement to replace the cottonseed meal that's Not as available as it once was, but now we have corn gluten feed and distillers and, and all this. So, you know, [00:25:00] it's not odd for us to have a 20 or a 30 percent feed that we're using.

I, I think these distillers cubes with that extra energy in the fat may have some improvements in efficiency of use. With those, compared to just some of our commodity blends or, or something like that.

Dana Zook (2): Yeah. Absolutely.

Dr. Paul Beck: And, you know, as I, I kind of mentioned for cows, we're using them at the South Range, the Spring Cabin Cow Herd there because it has the higher energy content it would be quite a bit higher in energy content than a, Like a, just a regular 20% range cube.

Dana Zook (2): Okay.

Dr. Paul Beck: We are trying to feed those on an equal protein basis

Dana Zook (2): than what you did at

Dr. Paul Beck: 20.

Dana Zook (2): Yeah. Okay. Okay.

Dr. Paul Beck: So, you know, we figure you know, 20 to 22% crude protein on a dry matter [00:26:00] basis for 20% range cube. Right. We're feeding about 50% less, you know, or 30 less. 'cause

Dana Zook: it's a 34% protein supplement. Yeah. So

Dr. Paul Beck: instead of four pounds, we may feed three or, you know, so you know, decreasing the total amount of supplement.

We feel like we're making some of that up with the, you know, the higher protein content and the higher energy content of those cubes.

Dana Zook: So it's a versatile cows and calves. And so that's great. It's out there. I just was in Freedom a couple days ago and they had, a supplement with distiller's grains in it and so they, she said producers may have been a little skeptical about what it is and it's higher cost, but you said it's higher protein, so you've got more bang for your buck there.

Any advice briefly that you would give producers who are kind of skeptical about a new product that might be above 400 a ton. But any advice you have as far as how positive you've [00:27:00] seen that feed product to cows and calves?

Dr. Paul Beck: Yeah, I would say look at it on, you know, a cost per unit of energy and a cost per unit of protein and feed it, feed it accordingly. That math still works. It sure does. And , it's a, it's a good product. It's, you know a versatile product. And but there's really nothing magical about it.

You know, if we can, if there is something that's a lot cheaper. That's not quite as good, then, you know, that would probably be the way to go.

Dana Zook: So basically, look at the math. Break it down. If you don't know how to do that, we'd be happy to help you in extension, right, Paul? Call us up. We love those questions .

But yeah, it's going to cost a little bit more because it's higher protein, but you'll feed less of it, and so it's more efficient in the, in the long run. But there might be options where there are, there is a cheaper product that works better.

Dr. Paul Beck: Yeah. Talk to. A lot of producers that have [00:28:00] used it in this way and, you know, their

because they're not feeding as much.

I'm, you know, I'm most excited about the stocker cattle implications. Absolutely. We're seeing some really nice gain responses. and really efficient gain responses. And we've had the good fortune of tracking these cattle through slaughter going to the feedlot.

And, you know, as we add gain on pasture, we always think we're going to see decreased performance in the feedlot. And we're really not seeing as big a decrease as, as what you would expect. We have had some cattle from these trials go and the cattle that were fed on pasture actually perform better on feed than the cattle that were not fed on pasture.

Interesting. So no, you know, absolutely the opposite of compensatory gain. Other [00:29:00] cases we've only seen about a 30 to 40 percent compensation of, of gain, so. If a person is going to retain ownership of these cattle through slaughter or through finishing that, those numbers really work out great profitability wise to add the gain on pasture, you're shortening your days on feed, decreasing the total number of pounds of concentrated, you know, feed that are, are being used in that system.

Okay. And the whole system is more efficient when we add more through these trials when we were adding,, more performance during grazing.

Dana Zook: On the front end of kind of performance.

Dr. Paul Beck: You know, as we're getting into these dry cycles, like you said, you know, we may not increase our stocking rate with those higher feeding rates.

We may be using those to just maintain what our normal stocking rate is. Yes. And that's as valuable, you know, in these dry situations [00:30:00] as, the ability to increase stocking rate I think. in a normal situation Right Because we all base our operation on a certain level of productivity to, to set our , net return goals and income goals and that type of thing and you know, having these wild fluctuations in the carrying capacity is not a very good outlook for, our, , dry cycles that we're having lots more volatility. So there's a lot of benefits in these targeted supplementation programs to fit these certain goals.

Dana Zook: Great, Paul. Thanks so much. I wanted some description of the distiller's process because

I feel it's a good product. I believe in those high protein products, so I think it's good to get just some more knowledge out there as far as how to use them, and so I appreciate you joining me to explain that.

Dr. Paul Beck: Great. Thank you very much.

Dana Zook: Yes. Listeners, check the show notes for extra information about some of the studies.

I'll probably put some links to some of Dr. Beck's [00:31:00] studies. Call your OSU Extension office with questions. We can help you work out the math as far as supplements, the cost of supplements, cost per pound of protein and energy. We are just happy to help you through those nutrition questions. Thank you for joining us and have a wonderful week.