Paul (Host):

Hello and welcome to the Rapidmicrobiology podcast, and I'm your host, Paul Carton. Today we're delighted to be part of a revolution in media preparation for food packaging testing. The traditional method of cleaning bottles, powder weighing, adding water dispensing, and autoclaving have all been replaced by the ReadyStream System from Merck KGaA, Darmstadt, Germany. The ReadyStream System is for pre-enrichment media preparation and requires none of the typical legwork and hands on time. Just set up the pre-sterilized stock solution, press a button and away you go, ready to dispense enough preheated sterile media for up to 440 25 gram food samples. And with me here today to tell us more about the ReadyStream System is Scott Medley, who was global product manager at Merck KGaA, Darmstadt, Germany. Hi, Scott. Great to have you join us on our podcast channel.

Scott Medley (Global Product Manager, Merck KGaA, Darmstadt, Germany):

Hi Paul. Thanks for having me. Really excited to discuss the ReadyStream System with you today.

Host:

I've skimmed over what the ReadyStream System is in the introduction there, but can you explain exactly what this ReadyStream System does and what's it for?

Scott:

The ReadyStream System takes all the media prep steps like you mentioned in your introduction there, and automates it, and the end result is it's dispensing sterile, preheated media. We do away with the need for powder weighing, bottle washing, moving bottles around the lab, no autoclaving of the media or any of the consumables, no need to pre-warm media in a water bath or incubator, and all in a bench-top system. So what we've tried to do is really take a lot of the pain points out of the media kitchen and automate it for the customer.

Host:

Okay. There are several ready to rehydrate media bags already on the market. What is so revolutionary about the ReadyStream?

Scott:

Some of the big advantages for the ReadyStream System is the media's concentrated. What we've done is we've, for our initial buffered peptone water launch media, we've made a 10X media bag. With that, the customer's getting a very large quantity of media in a very small bag, so it's not needing a large space. Like I said, it's all in a bench top system, the media bag's there, but what we're doing is we're diluting it with the pre-sterile sterilized, heated water. We've added dispensing as part of the system, so it's not just the media bag, it's also dispensing out of that media into a 1X concentration. Right? And the media bag is shipped dry so we're not shipping water across the world here.

We're not having big, expensive freight charges for the water, and the operator time to use the ReadyStream, for the setup, is really minimal. We're talking 10 minutes of hands-on time to set up

the system. And again, no autoclaving, all the consumables are gamma-irradiated, come ready to use. So the initial setup itself is, again, very simple.

Host:

Why do you think the market needed it? Where did the inspiration come from to invent and design the ReadyStream System?

Scott:

For the ReadyStream, the initial idea started with our team, was “let's create a large dry bag so we can have a large volume of media available”. That was something that's already on the market, and it was a me too product, was that initial idea. And so we said, "What else can we do with the system?" Working with customers with a lot of input on trying to discover, what are those pain points beyond, so we're not just creating the same old thing that's already on the market.

Like I said, we really analyzed those points to define what are the issues that the customers are having? What don't they like in the process? And along with that, our R&D team did a lot of discussions with customers, a lot of, we call them voice of customer activities, to understand those points. We also had, one of our scientists and marketing reps was actually working with a customer on designing a mobile laboratory, and they added, they said, "Could we have preheated water coming off one of your Milli-Q systems? We don't have room for autoclaves or any of that." So they could use a ready bag for their mobile lab.

All these points came together with our R&D team and our people out in the field with the sales team, working with customers to bring all these points. We've put all these ideas in to develop the ReadyStream System, to really eliminate the pain points, and make it easy for people to have media available on demand.

Host:

Just on that topic you mentioned about autoclaves and how the mobile laboratory couldn't use one, and this ReadyStream System doesn't require autoclave for the media prep as normal workflow would require, and obviously labs are looking to make their processes eco-friendlier and more sustainable. Can you go through what labs can save by moving to the ReadyStream method of media prep?

Scott:

The ReadyStream System, really, we've looked at those points as well and said, "How can we save energy? How can we save water?" We drastically reduce water and energy usage by just simply eliminating the autoclave. Those are very, very energy and water intensive steps, especially with water coming with washing media bottles and that cycle. We've completely eliminated the water needs there. The good thing too is, with the system, the media is not held at a temperature. It's not being held at your 37 or 42 degree. It's sitting at room temperature, and it's not being heated up until it's being diluted at the final step for dispensing. So it's adding the warm pre-sterile water from your deionized water system to the concentrated stock.

So in that way too we're saving the energy of not just keeping a media bag at temperature the entire time of its life. So yeah, I would say, yeah, Paul, all those steps come together to really reduce energy and water usage, which are some big concerns we heard from customers in the discussions with putting the system together.

Host:

You've mentioned a couple of parts of the ReadyStream System there. What are the consumables needed to run the ReadyStream System?

Scott:

It's pretty simple from a consumable side. It's our media bags, which contain our concentrated media. With the buffered peptone water, we're launching with, we'll have two sizes. A three liter bag which generates 30 liters of 1X media, and then a 10 liter media bag which will generate 100 liters of the 1X media. So we've got two sizes to accommodate most laboratory workflows.

And with those, it's five days of room temp stability after reconstitution; a nice life in the laboratory there. And yeah, the other consumable is the filter set, which is a 0.22 micron filter, one of our Millipore filters. And that's what's responsible, and that's what keeps the system alive with sterile water. It's filter sterilizing that incoming water from a deionized water loop or from a carboy in the lab.

Host:

You said that it's stable for five days, and if someone started to prepare the bag on the first day and they didn't use up all of it, or used only some of it, it doesn't go to waste, its shelf life is for five days at room temperature. Is that correct?

Scott:

Correct. The nice thing about the system is it's keeping track of it internally. The customer, they're not having to write on it, they're not having to keep track of it. They're also not having to worry about having it expire on board and still being used. The system, its got all the information from each lot programmed in when it's put on the system. So it's keeping track of the life of the filter set, and of the media bag, on the instrument,

Host:

It comes with a barcode scanner, so that's what the purpose of that is, is it? To keep track of those?

Scott:

Exactly. Yeah. Yeah. So the barcode scanner is used to put, when we're adding a new media bag on, we're scanning it and that's basically starting the life, and it's also keeping track of the volume of media that still exists in the system. Then also the same thing with the filter set, when that's being barcoded on, it's a unique barcode for each one. It's keeping track of how much water is being used through it and the life of it. For the filter set, it's keeping track for 600 liters of water, is the life, and for 30 days on the instrument. Whichever one comes first, the system will alert the technician or laboratory that it needs to be changed.

Host:

With some of those automatic dispensers, you probably have to program the flow rate and the speed it's put into the food sample bag. You can change the flow rate with this automatic dispenser, can you?

Scott:

Exactly. So we've got two priorities for the system. The first priority is being the flow rate. So that prioritizes getting the media into your filter bag or your container, whichever you choose, as rapidly as possible. The second priority setting is a temperature priority setting, so that's going to reduce the

flow rate slightly, but it will be more specific on getting the temperature. It basically narrows the range of the temperature fluctuations as it's coming into the bag.

Host:

You said the media is shipped, right? It's only... Obviously not the water is shipped. The media is from your GranuCult range, and this is gamma-irradiated granulated media, what are the ISO standards that this media complies with that laboratories need to know?

Scott:

Yes, like you mentioned, it's the GranuCult media, so it's the exact same buffered peptone water we sell in that range that's put into the bag. There's a whole host of ISO FDA standards that go along with buffered peptone water and enrichment of salmonella.

Host:

For testing for salmonella.

Scott:

Yep, exactly. The big one I think of is ISO 11133. I apologize for not being an expert for your listeners on all the ISO standards, but that's the big one. And the list of ISO standards that it complies with is definitely available on our website.

Host:

I did some research before, when I heard about the ReadyStream System, and I noticed that Merck had released a ready bag product several years ago. This was a pre-weighed similar gamma-irradiated granulated media pouch, but it was for a single 25 gram food sample enrichment for food patch and testing. And you added this under a laminar flow hood, but I imagine with the ReadyStream System, as you said, we're talking about a 10 liter bag, which is much larger obviously, and which can facilitate the pre-enrichment of 440 25 gram samples. How can a food microbiologist operate this under a laminar flow hood?

Scott:

That is one of the nice features of the ReadyStream System. It's a modular unit, so there are the two components of the system itself. The media preparation unit, which houses the concentrated media stock, and then there's the media dispensing unit. So, like a ready bag, if a customer wants to use in a laminar flow sterile conditions, the modular nature of the system itself allows the dispensing unit to be placed within a laminar flow hood and you can leave the media preparation unit outside. How you configure the system, there's some flexibility there that allows for placement of the system in the flow hood and ease of use for the system. There's enough distance in the tubing that that can be pretty easily accomplished without putting the whole system within the flow hood.

Host:

What size labs would this appeal to? What's the target market here?

Scott:

I think when someone initially looks at this, they go, "Oh, wow, these big media volumes, it's really only for someone that's doing a really high salmonella workflow or something." But we've really designed the system so that it can be approachable and usable by really any laboratory size. With our large media bag, that's 100 liter of the 1X media volume, that's 20 liters a day. I'll do the math for you here, but it's around 88 x 25 gram food samples a day. That flexes from a medium lab to a

real large scale laboratory as well, but with the smaller 30 liter size media bag, that's only six liters of media that needs to be used over that five day reconstitution period. That's looking at 26 food gram samples. Even if a smaller lab's using it, part of the consideration there is that the time saving, energy savings, all of that that comes into making media, they would still benefit greatly from using the system, even if there is some media left over at the end of the five day period.

Host:

Okay. I'm sure you're looking forward to getting out to conferences and talking to customers face to face once we put this pandemic behind us.

Scott:

Absolutely, Paul. Yeah, we've already had some units out in the field now and getting some feedback, and we're hearing some good, positive things. A lot of people, very excited with the ReadyStream System and the possibilities for the future with it.

Host:

Okay. And thank you for joining us today, Scott.

Scott:

Oh, yeah. Love it, Paul. Thank you so much. Appreciate talking with you.

Host:

And thanks for preparing food microbiologists for a new faster pre-enrichment method in food pathogen testing, and the system, as you said, I believe will be greeted with open arms in food testing labs around the world. And thank you to listeners for making the time.