SM South African runner Caster Semenya is a two-time Olympic champion and one of the fastest female sprinters in the world. But throughout her career, she's been hounded by questions about her sex. Here's a Nike ad featuring Semenya from 2018.

AS Would you prefer, I hadn't worked so hard? Or just didn't run? Or a different spot? Or stopped at my first steps? That's too bad, because I was born to do this.

SM Two years ago, a new rule required Semenya to take medication to lower her testosterone levels in order to compete in the races.

AS Sports have this way of reinforcing our binary assumptions about gender, when in reality we know that both gender and sexuality exist on a continuum, not a binary.

SM From Virginia Humanities, this is With Good Reason, I'm Sarah McConnell. Today, a look at sports through a Black feminist lens. Later in the show, the infamous basketball game between Team USA and Russia at the 1972 Olympics. But first, from Colin Kaepernick to LeBron James and Maya Moore, professional athletes have been using their platform to advocate for racial equality like never before. But it's not just the pros who are speaking out, college athletes are finding their voice as well. Here's With Good Reason producer, Matt Darroch.

MD Haley and her sister Mila are student athletes at the University of Virginia. Mila plays lacrosse and Haley's on the rowing team. They're twins, but only in the strictest definition of the word.

ASH Well, Mila and I, we are twins, but we're very different, I think.

ASM Yeah, we're really different.

MD They say they never planned to go to the same college, it just sort of fell into place.

ASH Actually, it was there was a camp where it was a rowing camp and a lacrosse camp at UVA at the same time. So, I went to the rowing camp and Mila went to the lacrosse camp. She was already committed, right? You had already committed?

ASM Yeah.

ASH And I wasn't committed yet.
ASM Where you?

ASH I don't know. I'm not sure. I don't know, but we were we were at UVA at the same time and it just like worked out.

MD Mila and Haley had both finished their first season on their respective teams. They were heading into the off season, excited for the future. But everything changed that summer.

ASM I remember the exact day that I saw it on the news.

AS [news outtake] Good afternoon. We're coming on the air now with breaking news in the killing of George Floyd, who died.

ASM And when they showed the video.

AS There are new developments in the death of George Floyd, the unarmed Black man.

ASM We were in D.C. We were at our mom's college friend's - old college friend's house like we call her Aunt Hope. We were at her apartment in D.C. and we just turned on the news. I saw the video and I was completely distraught. It like - it hurt to watch.

ASH It was actually hard for me to watch - first watch the video. I didn't watch it when it came on the news. I didn't really want to. It's just, you know, disheartening and - not even disheartening. That's just like not even - it's like, it would be an understatement to say that. Right. But it's definitely, you know, motivating for our generation. You know, what can we do as athletes who have a platform? How can we, you know, do our part?

MD Then an idea came by way of their mother, who was at a Black Lives Matter protest in Washington, D.C.

ASM She called us and she said it's such an important time in history right now and we can use our platform for athletes of all sports, all ethnicities, all races to voice your opinion and voice your support about the Black Lives Matter movement.

ASM They decided to create an Instagram account called Athletes for Black Lives Matter, a place where collegiate professional and former athletes can share their stories and support the Black Lives Matter movement.

AS Hi, my name is Angie Benson and I'm a goalie for a Virginia Tech Lacrosse.

My name is Aquil Abdullah, 2004 Olympian in the sport of running...

MD So far, they have dozens of video submissions.

AS All Black Lives Matter.

I stand with Athletes for Black Lives Matter.

MD It's become their passion to empower athletes and inspire change.
As athletes, when you're on a team, you know, it's not about what your teammate looks like or about like, you know, what they believe in, what their political stance is, what their major is. It's like we all come together with one goal: to play. So I think it's like it comes easy to us to, like, come together no matter your stance or your, like, opinions on certain things. It's like if we all agree that Black lives matter, we can come together and rally around that.

From With Good Reason, I'm Matt Darroch.

Serena Williams is widely regarded as one of the greatest athletes ever. Yet far too often her passion on the tennis court is criticized as aggression. Why do Black sportswomen seem to attract more scrutiny than other athletes? Letisha Engracio Cardoso Brown is a sociology professor at Virginia Tech, and she says the same commonly held stereotypes for Black women in society are also found in sport. Letisha, you've been looking at sports through a Black feminist lens. Help me understand what a Black feminist lens is showing you.

Yes, for me, Black feminism is deeply rooted in the idea that the personal is political and that we cannot think of ourselves as Black plus woman, plus middle class, plus... but we have to think of ourselves as all of those things at the same time. And so studying sports through a Black feminist lens is my way of centering the experiences of Black sports women who are often left out of conversations on race or in society.

When did you first notice this? When - what were you doing when you first noticed Black women in sports and how they were overlooked and sensationalized at the same time?

Hmm. I could tell that there was a difference in, for instance, coverage. Like, I knew that my dad would always be watching the football game on this day or the basketball game on that day. But women's gymnastics was something that we only saw really during the Summer Olympics. And even the WNBA, when that was emerging in the midst of my childhood, definitely received less attention than the NBA. And it was always something that struck me as odd, but also something that was so normal at the same time.

And then when you were a grad student at Texas, there was one runner who particularly caught your attention?

Yes. South African runner Caster Semenya. It was for me, 2011, I was working on a paper for class and thinking about stereotypes that impact representations of Black women athletes, and Caster Semenya's story just really struck me. She had been winning and doing so marvelously and yet the conversations that were being had were that she had an unfair advantage or that she was to man-ish to run with the "real" women. And that just kind of led me down this hole of, well, what is a real woman and are we upset because she’s so fast? Are we upset because she’s Black? Are we upset because she’s a woman or are we upset because of all of these things?

And you’ve been looking at stereotypes for Black women in sports and have found that a lot of the stereotypes Black women suffer in society are also showing up when they compete in sports?
LE Definitely. I mean, one of the most well-known stereotypes of Black women is that of the angry Black woman. If you're too assertive, too aggressive, too loud, then you're characterized as being an angry Black woman. And one of the sports women who has most been charged with this claim is Serena Williams. Her passion for the game gets translated into anger. And when we see white male tennis players engaging in the same or worse behavior, it gets reduced to, oh, you know, they're so passionate about their sport. Or even worse, "boys will be boys" kind of narratives that Black sports women aren't afforded the same courtesy.

SM There's a hideous political cartoon depicting Serena furious at the umpire at the recent match that she lost that really makes the point.

LE It's Serena, supposedly. It's this exaggerated, large framed, big lipped, angry person jumping on a tennis racket and shouting. And it's supposed to be Serena. And I actually wrote a piece about this, talking about how she was framed as being an angry Black woman during that match as opposed to someone who just number one, knows a ton about her sport, number two, is extremely passionate about her sport and number three, was correct of her assertion of what the umpire was doing.

SM There's some other stereotypes also that you think even more Black women are subjected to in sports as they are socially. What are the more typical ones you see used in the media about female Black athletes?

LE When I think about women, Black athletes, I often think about this notion of man-ish Amazons, which is one of the most stereotypical ways in which Black female athletes are talked about. As being hyper-masculine and unfeminine, or a femininity that exists outside of our binary understandings of masculinities and femininities.

SM That's such a good point about sports, really hyper-focused on gender and the assumption that women are sort of late comers. And then, as always, Black women are late latecomers.

LE Right, exactly. And that kind of brings me to my thoughts when I was in grad school of Black women athletes as being sporting space invaders. So, they're seen as invading these spaces that were at first, you know, homosocial white male spaces, like made for the purview of the white heterosexual man who had time to engage in leisure activity. And then we see the introduction of Black men into sport. But the ways that Black men were characterized as athletes, as being hyperaggressive and hypersexual, also shape the way that Black women would come to be framed when they entered sports. While a Black male athlete who is aggressive and, you know, hypersexualized might benefit because it's okay for men to be angry and aggressive, especially in sports. And it's - that is one of the only safe zones, really, for Black men to be kind of aggressive, right? But for a Black woman, because she's a woman and is supposed to be, quote unquote, feminine if she displays a similar amount of passion, you know, she gets dinged for it in the way of fines or in negative responses in the media.

SM After last summer, athletes have been using their platform to advocate for racial equality like never before. But you say there's a long history of activism among Black female athletes that goes way back, but is little told?

LE Yes, definitely. When I think about activism and sports, one of the images that most frequently comes to mind were the 1968 Olympic Games in Mexico City. And remember,
the late 60s, early 70s were a time of civil rights, black power, feminist movements and the American sprinters. John Carlos and Tommie Smith, who after winning their medals in the 200-meter dash, were on the podium and raised their fists, wearing Black gloves as a symbol of, you know, their stance against racism injustice. And they received so much negative attention. But during that same Olympic Games, the American sprinter, Wyomia Tyus was wearing black shorts in order to protest racism and injustice that existed in the U.S. and beyond. And it was also during that games that she became the first American, not the first Black American, not the first woman, but the first American sprinter, period, to win consecutive gold medals in the 100-meter dash.

SM What activism actions are you seeing these days by Black sports women that is not widely focused upon?

LE And thinking about Maya Moore, the WNBA player who sat out for multiple seasons at what was being called the twilight of her career in order to fight injustices in the criminal justice system in general and to free the wrongly convicted Jonathan Irons in particular. But when we talk about contemporary activism, the name that we most often hear is Colin Kaepernick. And Colin Kaepernick deserves to be talked about, I would never deny that. But Maya Moore as an individual and the WNBA as a league have long been standing for social justice issues and indeed dedicated an entire season to social justice. But we’re not having these conversations as widely as we are having conversations about Black male athletes that are participating in activist movements and ideals.

SM What could the rest of us do in a more active way to help or remedy some of this?

LE I think that we need to start thinking about players holistically and we have to get rid of the narratives that exist by transforming, you know, sports as a whole. I'm thinking right now that we have to be more careful in the language that we use in general when it comes to athletes and especially Black women athletes. And I think that it's time that they receive media attention in the ways that are comparable to male athletes. I also think it's time for pay to change, especially among Black women athletes. And people might say it's just sports, but sports are a reflection of the society in which we live. So the injustices that we see happening in sport are the same that are happening in the society around us.

SM Letisha Brown, thank you for talking with me on With Good Reason.

LE Thank you for having me. It's been a pleasure.

SM Letisha Engracia Cardoso Brown is a sociology professor at Virginia Tech. Coming up next, upset alert in Munich, West Germany.

[00:18:00]

SM At the 1972 Olympics, the USA basketball team had steamrolled through the competition to make it to the gold medal game against Russia. In fact, Team USA had been riding a streak of 63 straight wins, and it looked as if history was about to repeat itself. But what happened next was one of the craziest, most confusing upsets of all time. Chris Elzey is an historian at George Mason University. He says that 1972 basketball game opens a fascinating window into the Cold War tension between the U.S. and Russia. Chris, up until 1972, the U.S. Olympic basketball teams had never lost. Why were they so good?
Well, I think one thing that needs to be considered is the game itself, it was invented in the United States in 1891 and American teams had had much success, not only in the Olympics from ’36 when basketball was first introduced as an official Olympic sport. But let’s not forget intercollegiate, right, the college game was immensely popular.

Tell me about the U.S. team. Who was on that team? How old were they? Were there any superstars?

Well, this was the great contrast, right, between the U.S. team and the Soviet team. The U.S. team was young. They were, you know, college kids, average age of 21 and a half or so, a very talented, excellent college players. But they had only been playing together really for several weeks. And on the other side, you had the Soviets much older, probably the average age, I believe, was 27, 27 1/2. And unlike the American team, the Soviets had been playing together for a long while.

How big a deal was this game, this basketball showdown between the Soviets and the Americans? How much of it was a proxy for the Cold War? Was it seen as capitalism versus communism - the free world versus the Iron Curtain?

Oh, absolutely. You know, any time the United States and Soviet Union competed in anything, let alone sports but, you know, if you just think about the space race, right, it seemed that the world domination was at stake. And in athletics, it was the same thing. Also, I think it’s important for us to consider in 1972, this game between the U.S. and the Soviets took place toward the end of the Olympics. I think it was the penultimate day of the games. And prior to that, there were many issues, most notably and tragically was the slaying of the Israeli athletes and officials. But also, there were other concerns for American sports fans. First and foremost was the dismal performance by many American athletes at the time. I think the 1972 games, the United States had its worst showing up to date concerning gold medals. I think the Soviet Union at the end of the Olympics had won 50, the United States had won 33, and Americans were losing competitions and events they normally dominated. So, all of this kind of flowed into that game and, you know, you had the two best countries in basketball competing for the gold medal.

So what actually happened in the game? The Russians won, but it was really controversial in the final seconds.

Oh, extremely. You know, I when I teach this in my class, I like to call it the greatest WTF moments in sport history. What would happen, the United States had trailed for much of the game and toward the end of it, they started to mount a comeback. They got within one point, Doug Collins intercepted the ball with about five seconds to go, he drove down the court, he was fouled as he went up for the layup, he was given two free throws. The Americans were down 48 to 49 at this point, and he made both free throws.

That’s contemplated up in every party official indicate that foul, but they call it. Perhaps won the game.

During his second shot, the horn goes off, the Soviet player disregards the horn, throws the ball in bounds. The officials stop the game after two seconds have expired from the clock. They then try to reset the clock back to three seconds.
AS  Now, I am totally confused. They’re changing the clock, is what they’re doing. They’re going back to three seconds, is what the P.A. announcer said.

CE The Soviet player is handed the ball by the official. He throws it down court, the ball, bounces off of the backboard. Americans thinking the game was over, begin to celebrate, patted one another on the back, jumped up and down. It was an exciting moment for these young men.

AS  Wow, what a win for the United States. The second to gold medal. This is crazy.

SM But it wasn't over. They added three seconds onto the clock again.

CE Yes, they did add three seconds onto the clock, because if you watch the recording carefully, the official handed the ball on that first play before the clock had been set - reset to three seconds. So, the sounding of the horn was not to end the game, but was to get the officials' attention that they were starting the game before the clock had been reset.

AS  Now we’re being told the scoreboard is not correct. And they are running the clock down ... he's coming to the bench to get the official count. The horn had sounded. And apparently, they're trying to move the clock back down to the three second that was indicated, was official.

SM And so in the final three seconds that were put back under the clock, the Russians throw a long pass from one end of the court to the other and score a basket.

CE Exactly. Alexander Belov catches the ball, lays it in, and now it's the Russians' turn to celebrate. Bedlam erupts.

AS  Alexander Belov, American defender. Back there with the import and a Russian demon, Bob - Alexander Belov. This time it is over.

CE You can see a pile of human bodies, the Soviet players, and then one of the players lifts up a bottle of vodka.

SM That's great. How big a deal was this in Olympic history, in sports history? Where the headlines are huge?

CE Yeah, of course. You know, this was the U.S. against the Soviet Union. And if you add in the controversy surrounding it, Americans were devastated, and the Soviets were ecstatic. Shirley Povich, the noted journalist, wrote in his column "In the basketball finals are Russian brothers, brow beat the Brazilian referee and demanded and got what amounted to three final whistles. They used Russian terror mathematics to stretch the one remaining second on the clock into a useful six, then said they had just come from behind to beat the American team by one point" end quote.

SM You know, with perspective, you realize there's so much politics in sports, right? Sports are a stand in for so many of the beliefs and joys, divides and misbeliefs we all have.

CE Oh, of course. It just casts those views in very stark terms, and I think this game shows that. One of my favorite expressions of American attitudes about this game, there was an editorial cartoon done in the Dayton Daily News, I believe the paper was. And you have an
American reporter interviewing the basketball players after the game. And through each of the players, torsos are gigantic screws. And the reporter asks the players, "Other than that, how did you enjoy the Olympics?" So, you know that that gives you a sense, I think, of the American attitudes. But like I said before, I think the game just finished so quickly that Americans didn't have time to process this. And, you know, I've been into archives and there were telegrams and letters from Americans, angry letters, saying the Russians had stolen this game, that they had somehow conspired with the officials, much like what Shirley Povich had said in - in his column.

SM Well, Chris Elzey, thank you for sharing your insights with me on With Good Reason.

CE You're very welcome. I enjoyed it. Thank you.

SM Chris Elzey is a history professor at George Mason University. This is With Good Reason; we'll be right back.

[00:28:00]

SM Welcome back to With Good Reason at Virginia humanities. Many people think of the 1990s as the golden age of professional wrestling, and nothing captures the mystique of that era, quite like WWE superstar "Stone Cold" Steve Austin and his iconic walk out music. Our next guest is Marc Ouellette, he's an English professor at Old Dominion University and says professional wrestling's popularity during the 1990s reflected a perceived decline back then in masculinity. Marc, your interest in professional wrestling was actually sparked by your childhood priest. Tell me about that.

MO Sure, that is kind of a fun story. We had a wonderful parish priest, Father Lannoo, and he's kind of a legend in our in our area. I grew up just outside of Windsor, Ontario, right across the river from Detroit. And our priest, Father Lannoo, used to, as a reward for altar boys, just occasionally say thank you. But he was a fan as well. And so he would load seven or eight or as many altar boys as could possibly fit into a giant 1975 Chrysler Imperial four-door. And he would drive us down, and the tapings were Saturday mornings in Windsor at the University of Windsor math building. And so the wrestlers would come across the river from Detroit and Father Lannoo would actually sit in the front row with all the altar boys, and he would give the wrestlers a blessing beforehand and the masked wrestlers and even - even the heels and the bad guys. So it was - it was great fun to have as a kid.

SM Everybody knows professional wrestling is staged, but fans love that each wrestler has their own story, your back story. Help me understand how that has evolved.

MO Sure. When I was a kid, the story was really, really easy. There were bad guys and there were good guys. Or as they call them, wrestling baby faces and heels. And a lot of the heels were really obvious. There used to be a guy in the - he wrestled frequently in the Windsor Detroit promotion, and his name was Hans Mueller. And he was a stereotypical sort of German World War II derived figure like you'd see in one of those 60s movies or TV series like Rat Patrol. Very, very cartoonish, black and white, good or bad. And Nikolai Volkov was a - was a Soviet, allegedly Soviet, there was another guy called Borus Zukov, and he was allegedly a Soviet. And there was the Iron Sheik from Iran. And as - as it progressed, the stories got more involved.
SM How did the stories and the characters develop after, let's say, the bad guys were typically first Nazis, then Russians, then Iranians? What evolved after that?

MO Well, the next thing that happened was really in the 90s, there was a big trend towards what we call serial downsizing in industry. And you think about corporations at the time, like Enron, Merck, WorldCom and the corporation went from this patriarchal institution where you could walk in right out of school and then walk out 30 years later with a watch, to when we started to have the sort of the first tastes of the gig economy - of people not working for long and serial downsizing. And as we're having economic and social change partly wrought by technology, we're also having this portray itself in our popular culture, in our entertainment. So that the enemy becomes your boss. And we see more and more movies - the Michael Douglas movie "Falling Down" is a great example of a movie like where the enemy is sort of this faceless boss or faceless corporation. And you can see it even in Rambo, where Rambo goes through and destroys all of the monitors. And that becomes a big thing in wrestling, where the wrestler will run backstage, be mad at his boss, grab a television and smash it. And so the boss becomes the enemy and wrestling gets to play this out in a really, really visceral, physical way that fans can relate to.

SM So when all of these changes were coming about on the job place, you talk about the effect on masculinity. But it was making men feel what?

MO The word that Susan Faludi and her big bestseller "Stiffed: The Betrayal of American Man", she uses the word 'stiffed' - that masculinity and men in North America had been sold a - sort of - sort of a bill of goods, and they were now being held responsible for being told that they didn't have, in her words, "a useful role in public life". And so there was a lot of sense of masculine diminishment. But on the other hand, Newsweek runs a cover almost on a 10-year cycle, "Crisis in Masculinity". I have them on my computer to show people. There was one that they ran in '99, there was another one in 2010, and there was another one they ran last year. And it shows me that America has a monstrous investment in masculinity. And this sort of success of a quote unquote, "American Man" is part and parcel of the American project. And yet we know that increasingly there are fewer and fewer jobs that actually require that sort of built bodily masculinity. And it's going to get smaller.

SM So describe some of the superstars of pro wrestling in the 1990s and what kind of increasingly complex stories were associated with them?

MO Sure. Probably the two biggest ones became a guy by the name of Steve Austin, whose real name is Steve Williams, and he became sort of an everyman. He hated his boss. He wore blue jeans. He drank Budweiser and used rough, coarse language. Liked to settle things with his fists, punch first, ask questions later, that sort of thing. But he was also - you could see the way that part of the story became, that his boss hated him, that he wasn't part of the corporate image that they wanted to project, at least as the story went. So, the boss was out to get them in, out to try and fire him. And he was going to be - he was going to be downsized. The other one in the in the rival formation, the WCW, was Ric Flair and Ric Flair had been - he's one of the longest serving professional wrestlers in history. And he's one of the best-known monstrous career titles and all these other things, but a controversial figure. And he'd been known as the Nature Boy. And just like Austin had that connection with nature, the "Stone Cold", and they called him a rattlesnake. Flair was called the "Nature Boy" because everything came natural to him. And he played sort of glamorous playboy sort of figure. But he became this sort of older wrestler who was being pushed out by the new era, and that became sort of the way that storyline played
out. So, there is two rival versions of corporate machinations that were - that were happening of trying to push undesirable people out of a job at the same time that there was this serial downsizing going on in contemporary life.

SM How did the stories get spread? How to fans learn the stories, ever evolving an ever more complicated behind these favorite wrestlers?

MO Well, part of it was the Internet. The rise of the Internet happens at more or less the same time. And there was also the media coverage and cable played a big change in that as well. They became known as the Monday Night Wars, where there was rival primetime shows on Monday nights, and that was circulated by cable. And of course, WCW was owned by Ted Turner at the time, so they had that corporate power. And then there was also more coverage of it in mainstream and other press. And kind of a funny story - by the time this happened, when I arrived to teach at a university, one of my students at the time in undergrad had started as a blog writer. And then he got picked up by a national newspaper and ended up having a syndicated column online and in a national newspaper about professional wrestling. So, it was - it became this sort of thing where there was this change in also media coverage that happened in the ability of fans to become more participants in the coverage. And that changed things as well.

SM You know, some critics of pro wrestling call it hyper-violent and sexist. And yet you've written that that criticism actually makes wrestling even more attractive to its fans in many cases. How so?

MO Well, we can see that in in a variety of ways, it plays out as in sort of an us vs. them, that there's this group of perceived elites. And we can - we can see this - it plays out - I don't even have to make allusion to it. Everybody will see that this plays out right now and in contemporary politics. That there's a perception of an elite group that's out to keep a certain group of people and their, quote unquote, "everyday Americans" down. And it becomes sort of an us or them. So - so the WWE in particular has used this to advantage to sell more tickets. Even going so far as to stage a protest more than once, that the WWE was going to be protested against by an activist social justice group and then basically having it staged and it became part of the show. So not only does it become part of the show, but it becomes, okay, we spoofed you. We've just made fun of you. You've made fun of yourselves and it becomes - in contemporary logic or vernacular of the day, it becomes, you know, trolling and owning to the nth degree and it becomes part and parcel of that.

SM That's so interesting. As I was reading about some of the staging that goes in with characters coming out to music and that sort of thing, it made me think of Donald Trump descending the escalator when he made his presidential announcement to music.

MO Yeah. And he's used this sort of thing before. They've used - he actually was a participant in WWE matches and events. And he's known as a - as a friend of the McMahon family, which controls the WWE. And Linda McMahon, the matriarch of the McMahon family was actually appointed to a governmental position by Donald Trump after he became president. So that connection is - is a strong and long one.

SM That's interesting. Maybe - maybe it could be like polling. As goes pro wrestling, so goes the political atmosphere?
There is some truth to that. But wrestling fans are a lot more savvy, I think sometimes than people give them credit for. They are very much aware of what’s going on. It is a very media savvy audience, but they are looking to be entertained. That’s the number one thing is they are looking to be entertained. If it weren’t entertaining, people wouldn’t go. In 2007 at wrestle mania, Donald Trump was involved in the production of the show as a billionaire versus billionaire against Vince McMahon. And one of the highlights of the show for a lot of fans was Vince McMahon getting taken down by Donald Trump.

Donald Trump! Oh my God! Takeover! I didn’t think he’d do it! [Cheers]

And he did go into the ring afterwards and McMahon got his - his head shaved - it was a hair versus hair match sort of - sort of thing, which is a classic wrestling move.

Trump and Lastly shaving Mr. McMahon bald.

No! Don’t do this to me! No! Stop it!

Mark Ouellette is an English professor at Old Dominion University. Coming up next, a new sports drink that endurance athletes swear by, but does it actually work?

After Eliud Kipchoge broke the record for the fastest marathon in 2019, endurance athletes all over the world scrambled to uncover the secret to his success. Some found answers in the shoes he wore, others in the sports drink he consumed. Dan Baur is a physical education professor at Virginia Military Institute and an athlete himself. He studies the hydrogel sports drink that fueled Elliott clip coaches record breaking run. And Dan says the drinks effectiveness is inconclusive at best. Dan, over the last few years, people have gotten really interested in these hydrogel drinks, especially long-term sports. What is hydrogel and what’s a hydrogel drink?

It's an interesting new supplement. And the primary ingredient that - that makes it a hydrogel or at least as is used in these products, is called alginate. Alginate is mostly derived from seaweed, actually, for its properties to form a gel in certain conditions. So, the interesting thing about it is you can design it to change form based on when you need it to change form. So, for example, if you were to put this in one of these drinks, you can drink it as a fluid and then once it hits your stomach and hits the certain that level of the more acidic environment of your stomach, it turns into a gel. And for - for many reasons, that's of interest to sport nutrition researchers because it can influence how it's digested.

Do you ever do endurance sports yourself?

Yeah, actually, I grew up running and riding. I was a competitive cyclist for many years. I got into it when Lance Armstrong was at his peak. Obviously, things have changed since then, but it's actually sort of what drew me to this topic and research. I always used to ride, you know, I was - I was a decent rider, but I was very good for the first hour. So I'd go out and - and pound up the hills for an hour and I thought I was Lance Armstrong. But then every time I would become depleted of energy and I would be like a different person. So, when I finally started studying this stuff and I learned about how it works and how much carbohydrate one requires and - it changed my life, I could go from writing for an hour,
very hard to four hours. And I'm feeling just as good as I did in the first hour. So that was sort of an eye-opening experience for me and it brought me into it.

SM Well, the advice for long distance runners and cyclists and others has changed so much over the years. When you were young, when you were on, you know, an elementary school age team, what did they used to advise you eat?

DB I guess, orange slices, if anything. I remember that at the halftime at the soccer games.

SM Yeah.

DB But going back even further - so I'll give you the sort of the long story of it. So, after the 20s, after the 30s, there became this notion that carbohydrate or even fluid during exercise should be avoided or minimized. So all the way up into the 70s, people consumed very little of anything, even fluid. And as you remember, you've probably seen the commercials, Gatorade was developed in the 60s, but that still took a while to really catch on. And even into the mid to late 70s, there was still this resistance among endurance athletes to take anything. So a good example, this is Alberto Salazar, who is one of the most famous marathon runners in American history. He used to be an incredible marathon runner. He would run two-hour, ten minute marathons and he wouldn't drink a drop of water, a drop of carbohydrate in any of the races that he did. And ironically, he almost died multiple times from dehydration and overheating. So from then on, research started to change in the 80s and we started to see some studies come out that showed pretty definitively and consistently carbohydrate works. If we consume it before and during exercise, we can exercise for longer and faster and perform better.

SM And what's the understanding of why the body needs it? Well, part of our bodies are craving that infusion of carbs.

DB Carbohydrate is the muscles primary exercise fuel. So, any exercise of a moderate to high intensity your - your muscles depend on carbohydrate. The issue is our bodies are very good at storing fat. We can store, you know, 200,000 calories worth of fat in our body. But the average person only stores about 2500 calories worth of carbohydrate. And so, if you think about it in terms of a marathon, a good estimate for the metabolic cost or the energy cost of a marathon is about 100 calories per mile. So, if you do the math, you know, 26 miles times 100 calories, you're at about 2600 calories. So, if the assumption is that you're primarily burning carbohydrate, because for most competitive marathon runners, they're running at an intensity where they're using carbohydrate as their primary fuel. They're coming very close to running out of it in that race. And usually when you hear the term hitting the wall, usually what that represents is that they are more or less depleting the carbohydrate that they have stored inside their body.

SM And what's the recommendation of how people in, let's say, a marathon or long cycling actually ingest carbohydrates along the way, right?

DB Right. The recommendation is - and so we'll get a little detail, but generally they recommend between 30 to 90 grams per hour. So, if you look at a typical Gatorade, the way that they have it mixed, I believe it comes in at around 30 to 45 grams per hour. So if you're drinking a bottle of that per hour, you're pretty much right onto those recommendations. But they've changed a little bit in recent years in that now they're recommending closer to the higher end of that range. So closer to the 90 grams per hour,
which is quite a bit. And it's pretty concentrated doses of carbohydrate if you haven't tried it before.

SM And where does your body primarily absorb this the quickest?

DB It's absorbed through the intestine, so it's actually pretty rapidly absorbed as well. So if you consume carbohydrate while running or cycling, you'll usually see it appear in the blood, if we're measuring it within 10 to 15 minutes. So it's something where if you are starting to consume it early and often, it's going to provide an alternative fuel source throughout that exercise and hopefully help you to either provide, as I said, an alternative fuel or to even help you save the fuel that you already have so that you can save it till the end of the race for that final sprint to the line.

SM When did you first start to notice that friends of yours and other athletes were really interested in this idea of drinking hydrogels?

DB I think for me it was - the thing that's drawn most people to this product is Eliud Kipchoge, who's probably the most famous runner in the world right now. He just broke the two-hour marathon record by running 1:59:40, which is a 4:34 mile, times 26 miles, which is, you know, arguably up there with Roger Bannister breaking the four minute mile in terms of athletic achievement. So that's going to draw all the attention in the world. And then you combine that with the fact that he was apparently consuming this hydrogel substance throughout. And obviously the company that makes it contends that it helped him in his race. It definitely warrants excitement and research.

SM When you decided to do an experiment, what did you set up?

DB So we set up an experiment with cyclists and we set it up with three experimental trials where they would come into the lab and ride on the bike for three and a half hours and basically torture themselves for three and a half hours. We'd be feeding them the stuff from before they started and then every 15 minutes of exercise. And throughout, we were measuring their metabolism so, what fuels they were using, we were measuring their energy demand or how much - how many calories they were burning. We were measuring their gastrointestinal comfort, which is key with this product. And that's sort of their selling point, that it's supposed to enhance how it feels in the stomach. And then obviously we measured their performance to see whether there were any differences between them. So, what we did was we compared the hydrogel product to a sort of traditional mix, which is just a glucose combined with fructose. Those are two simple sugars. And it's usually what you'd find in something like a Gatorade. And we found there was no difference between the two.

SM Even though that's what you discovered, were any of those cyclists still interested in continuing to use the hydrogel liquid?

DB Yes. And like I say, a lot of it comes down to personal preference. You know, if you find something that you like - and really this is this is good advice for anybody that's looking for sport nutrition advice. If you find something that works for you and that you, like, keep doing it. And especially if you believe that it works, right. If there's a placebo effect occurring, even if it's a placebo effect, it's still benefiting you. But the other part of it is, the product is still - you know, the hydrogel is the - the added ingredient that's very interesting. But it still contains carbohydrate in the exact same amounts that you would
want. So, it's still providing you what you need. The question is whether that added alginate hydrogel is actually providing any effect at all.

SM Is there any pressure, do you think, on scientists to fudge results when a product is this popular and first comes out?

DB Yes, I think definitely so, and that's one of the things that we have to deal with the scientist is, you know, companies want to work with scientists and a lot of that, you know, sometimes that's genuine interest in scientific innovation that they're seeking to do. And other times they're trying to get sort of a rubber stamp on their product to make it more appealing to - to the general public. But also, as scientists, the way that incentives are set up now in academia, you know, there's certainly incentives for people to publish exciting research that has positive effects that are definitive, and especially if it's - if it's something that crosses over into popular culture, like products like this does.

SM That's fascinating to me. Dan Baur, thank you for talking with me on With Good Reason.

DB Thank you. It was great.

SM Dan Baur is a physical education professor at Virginia Military Institute. Support for With Good Reason is provided by the University of Virginia Health System, pioneering treatments to save lives and preserve brain function for stroke patients, uvahealth.com. With Good Reason is produced by Virginia Humanities, which acknowledges the Monacan nation, the original people of the land and waters of her home in Charlottesville, Virginia. Our production team is Allison Quantz, Matt Darroch, Lauren Francis and Jamal Millner. Maya Nir, Cassandra Deering and Dontae Woodfolk are our interns. For the podcast, go to withgoodreasonradio.org. I'm Sarah McConnell, thanks for listening.