

Crossfit's "scientific" refusal to allow Chloe Jönsson to compete in women's division not actually supported by science

By Mari

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Abstract

In a situation that recalls the recent controversy around MMA Fighter Fallon Fox, Chloe Jönsson, a trans woman, was recently banned from competing in the women's division of Reebok's CrossFit athletic competition, a high-intensity endurance fitness challenge with a cash-prize of \$250,000. She is now suing Crossfit for \$2.5 million for discrimination. In the letter [...]

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This is simply wrong as a matter of human biology and if you can't see that, there really isn't much to talk about. Chloe was born, genetically - as a matter of fact - with an X and a Y chromosome and all of the anatomy of a male of the human race. Today, notwithstanding any hormone therapy or surgeries, Chloe still has an X and Y chromosome. Thus, you're [sic] statement is categorically, empirically, false. ... The fundamental, ineluctable fact is that a male competitor who has a sex reassignment procedure still has a genetic makeup that confers a physical and physiological advantage over women.

Unfortunately, CrossFit's statements conflict strongly the current understanding of the physiology of transition and our understanding of the human genome, along with current standards of major sports rules-making bodies.

First, let's start with some basic biology. The difference in genetic makeup between a typical cisgender male and woman are entirely coded by the Y chromosome. Cisgender women typically have two copies of the X chromosome, men one copy of X and one copy of Y. Absolutely nothing about physical sex differentiation is encoded by any of the rest of the human genome. A portion of the Y chromosome contains genes that correspond to genes on the X-chromosome, along with a region known as the Sex-Determining Region of Y (SRY). It's important to understand that SRY is what actually determines the differentiation of the human gonads into testicular tissue, instead of their default program, which is ovarian tissue. The testicular tissue then releases testosterone into the fetus which

guides development going forward.

It's the production of testosterone from the testes that drives the development of all remaining male primary and secondary sex characteristics, at least within our current understanding of developmental biology. Quite literally, everything about being physically male is driven by the presence of the appropriate amount of testosterone in the body. Following testicular differentiation, the composition of one's genome means functionally nothing. This is strongly supported by the fact that mutations in the androgen receptor gene (the protein that allows the body to be influenced testosterone) will lead to female body phenotype (and almost always a female gender identity), even with a completely-intact SRY region on the Y-chromosome, a condition known as Complete Androgen Insensitivity Syndrome (CAIS). Damage to the SRY region itself will similarly produce female body phenotype and a female gender identity, despite being XY- a condition known as Swyer Syndrome. Under CrossFit's definition male and female, women with CAIS and Swyer Syndrome would logically have to be considered male, despite being assigned female at birth, and having anatomy (other than lack of a uterus and ovaries) indistinguishable from an XX female. Precisely because of the numerous challenges and complications in the notion of "genetic gender" the International Amateur Athletic Foundation (IAAF) abandoned genetic gender testing back in early 90s.

The only "evidence" for the inviolable nature of genetic gender that the CrossFit representative provides is a link to the Encyclopedia Britannica article on sex chromosomes, which consists of less than 500 words. Meanwhile, a quick search of PubMed (the largest research engine for medical science research) with the terms "Genetics of human sex differentiation" yields over 6000 published articles. Even the World Health Organization's basic introduction to sex chromosomes takes care to mention the non-universality of XX and XY as male and female determination.

Furthermore, one of the key goals of hormone treatment in transgender women the suppression of testosterone production and effect. Transgender women on hormonal therapy, and those who have undergone gender-affirming surgery generally have circulating testosterone levels far less than a cisgender woman, often with a goal of an undetectable level. The long-term effects of low testosterone paired with estrogen administration include significant loss of overall muscle mass, increase in body fat percentage, and decrease in strength and strength and potential. After all, there's a reason anabolic steroids are used as performance enhancing drugs, because testosterone is needed maintain high levels of muscle. After years of hormone therapy and having had gender-affirming surgery, Ms. Jönsson is unlikely to have a body composition that differs significantly from any XX female in the CrossFit competition. Using CrossFit's own "Compare Athletes" function, one can see that her maximum lift weights are actually well below CrossFit's two most recent female champions, and on order of half that of a male competitor. Furthermore, a sampling of 20 random female competitors places Ms. Jönsson functionally in the middle of the pack, with 9 having higher maximum lifts, and 11 having lower. It's difficult to see how a trans woman of comparable size and strength cisgender women in her sport would have a competitive advantage by virtue of her Y chromosome.

Additionally, CrossFit's claims that this determination is out of a desire to maintain fair competition contradicts the current standards of both International Olympic Committee (IOC), and the National Collegiate Athletic Association (NCAA). The current IOC guidelines, released in 2004, require: gender-affirming genital surgery that includes removal of the gonads, 2 years of hormone therapy

following surgery, and legal recognition of one's gender. In 2011, the NCAA released an extensive document explaining its new policy of allowing transgender athletes to participate after a year of hormone therapy. In establishing this policy, the NCAA sought the opinion of several medical experts in this area, most notably Dr. Eric Vilain of UCLA who also sits on the IOC's medical advisory board. On the subject of competitive fairness, they state:

It is also important to know that any strength and endurance advantages a transgender woman arguably may have as a result of her prior testosterone levels dissipate after about one year of estrogen or testosterone-suppression therapy. According to medical experts on this issue, the assumption that a transgender woman competing on a women's team would have a competitive advantage outside the range of performance and competitive advantage or disadvantage that already exists among female athletes is not supported by evidence.

CrossFit concludes in its letter that:

Our decision has nothing to do with "ignorance" or being bigots - it has to do with a very real understanding of the human genome, of fundamental biology, that you are either intentionally ignoring or missed in high school.

Chloe Jönsson would be eligible to compete in any Olympic women's sport, arguably one of the most prominent and tightly-policed athletic competitions in the world, as well as any NCAA women's sport- were she a student. Given that these organizations, both under considerably higher scrutiny for fairness than a commercial group like CrossFit, allow trans women to compete in women's events and both organizations consulted extensively with medical experts before establishing such policies, it's difficult to see on what ground CrossFit's stands for their exclusion of Ms Jönsson from the women's competition, and where the alleged knowledge of biology and the human genome upon which this decision was made is derived from.

Author's Note: Thank you to reader Rehan Basson for running down a portion of the scientific reading that went into this piece and sharing it with us.

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