

Dietary supplement lycopene from tomatoes discovered to boost sperm quality

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Professor Allan Pacey and Dr Liz Williams with their team at the University of Sheffield. Credit: University of Sheffield

Sperm quality can be improved with a simple diet supplement containing a compound found in cooked tomatoes, according to new research by the University of Sheffield.

The discovery could transform the outlook for men with fertility problems and lead to better ways to reduce the damaging impact of modern living on reproductive health. Of all infertility cases, approximately 40 to 50 percent are due to "male factor" infertility.

The first ever double-blind randomised controlled trial to assess the impact of giving men a dietary compound called LactoLycopene, was led by Allan Pacey, Professor of Andrology Reproduction and Head of the University of Sheffield's Department of Oncology and Metabolism, and Dr. Liz Williams, a leading specialist in Human Nutrition at the University of Sheffield. The team discovered it is possible to increase the proportion of healthy shaped sperm ([sperm morphology](#)) and boost 'fast swimming' sperm by around 40 percent.

Lycopene can be found in some fruits and vegetables, but the main source in the diet is from tomatoes. Lycopene is a pigment that gives tomatoes their red colour, but dietary Lycopene is poorly absorbed by the [human body](#), so the compound used for the trial was a commercially available formulation called LactoLycopene; designed by FutureYou Cambridge to improve bioavailability.

The 12-week trial designed by Dr. Williams involved 60 healthy volunteers aged 19 to 30. Half took LactoLycopene supplements and the other half took identical placebo (dummy pills) every day for 12 weeks. Neither the researchers nor the volunteers knew who was receiving the LactoLycopene treatment and who was receiving the placebo. Sperm and [blood samples](#) were collected at the beginning and end of the trial.

"We didn't really expect that at the end of the study there would be any difference in the sperm from men who took the tablet versus those who took the placebo. When we decoded the results, I nearly fell off my chair," said Professor Pacey, a world expert in male reproduction.

"The improvement in morphology—the size and shape of the sperm, was dramatic. We used a computer system to make these measurements, which takes a lot of the human error out of the results. Also, the person using the computer didn't know who had taken LactoLycopene and who had taken the dummy pills either.

"This was the first properly designed and controlled study of the effect of LactoLycopene on semen quality, and it has spurred us to want to do more work with this molecule."

"We were surprised by the improvement in [sperm quality](#) shown by the results," said Dr. Williams. "This was a small study and we do need to repeat the work in bigger [trials](#), but the results are very encouraging. The next step is to repeat the exercise in men with fertility problems and see if LactoLycopene can increase sperm quality for those men and whether it helps couples conceive and avoid invasive fertility treatments."

Her team, which included three other researchers Madeleine Park, Aisling Robinson and Sophie Pitt, is hoping to embark on the new study as soon as possible.

Professor Pacey said the work so far has not investigated the mechanism for Lycopene's beneficial action but it is a known powerful antioxidant, so is potentially inhibiting the damage caused by oxidation of sperm which is a known cause of male [fertility problems](#). He believes this antioxidant effect is key in producing the improvements in [sperm](#) quality seen in the trial, and is hoping to investigate this more.

The results have been published in the *European Journal of Nutrition* today (8 October 2019).

More information: Elizabeth A. Williams et al. A randomized placebo-controlled trial to investigate the effect of lactolycopene on semen

quality in healthy males, *European Journal of Nutrition* (2019). [DOI: 10.1007/s00394-019-02091-5](https://doi.org/10.1007/s00394-019-02091-5)

Provided by University of Sheffield

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