Dairy cows could be a thing of the past if Imagindairy succeeds in growing milk proteins using yeast | Photo source Christian B. from Pixabay

USING YEAST TO MAKE COW-FREE MILK

FOOD & DRINK

Imagindairy's process involves creating models of gene expression and using these to induce yeast cells to produce milk proteins

Spotted: We've seen beef without the cow and nuggets without the chicken, now a startup is working to produce milk without the cow. Israeli-based Imagindairy was co-founded by Tel Aviv University professor Tamir Tuller and is developing ways to use bioengineered yeast cells to produce milk proteins, which could then be used in milk and cheese products.

Imagindairy's process involves creating models of gene expression and using these to induce yeast cells to produce milk proteins. Gene expression is the process by which the instructions in our DNA are converted into a functional product, such as a protein. A similar approach is being used by California-based Perfect Day Inc., which uses fungi rather than yeast to produce the proteins.

Tuller points out that the technology involved is not new – companies have been using gene expression to create proteins for medicines, vaccines, energy, and food by transferring genes from one organism to another for years. What is newer is Imagindairy's use of proprietary AI algorithms to develop the modelling needed.

The company still has a number of hurdles to leap before we can look forward to animal-free milk. These include the difficulty of getting the proteins exactly right, so the products taste just like cow's milk, and issues with scaling up cheaply. Tuller explains that "Even though we know what the genes that encode the proteins for cow's milk are, those genes are written in the language of cow cells, and need to be rewritten in the language of yeast. This will make the production of the milk proteins possible in an appropriate, affordable, and efficient way in the yeast cell factory."

Imagindairy is not alone in seeking to replace animal products with indistinguishable simulacrums made without the animal. Recently, another Israeli company developed a way to mass-produce cultured steaks, and 3D-printed chicken nuggets may shortly be ready for mass roll-out.

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Takeaway:

Each year, the world produces more than 840 million tonnes of milk, and dairy products are a very common source of protein. But growing concerns over deforestation for grazing land, carbon emissions from large-scale animal husbandry, and animal welfare have turned a lot of people away from dairy products. If Imagindairy can succeed, it will allow the creation of dairy products that are sustainable and safeguard animal welfare. As Tuller points out, there is the possibility that “within a fairly short time, we will be able to prepare in our own homes, toast with yellow cheese that was made from yeast and not from cow's milk, without having paid any more for it."