SOLUTIONS FOR HYALURONIC ACID MANUFACTURE

TATUA

Tatua offers solutions for improved, efficient manufacture of hyaluronic acid

Insight

Hyaluronic acid is a biomolecule that has become commercially important in the medical, cosmetic, and food industries, due to its wide range of applications. The production of hyaluronic acid through microbial fermentation of *Streptococcus equi zooepidemicus* has become the preferred method for manufacture on the industrial scale.

The cost of hyaluronic acid manufacture through fermentation is influenced by a number of factors – central to which is growth media selection.

Solution

The choice of nitrogen source in growth media can greatly influence growth performance of *Streptococcus equi zooepidemicus* such as titre (yield), and time to fermentation endpoint.

Tatua dairy, soy, and pea peptones show comparable or superior titre (yield), or time to fermentation endpoint compared to industry standard dairy and soy peptones, and yeast extracts.

Higher titres and faster batch turnaround times can offer significant cost savings to hyaluronic acid manufacturers.

Benefits

- Tatua sources dairy protein raw materials (casein and whey) directly from its own NZ-based milk supply, and is the only peptone manufacturer with a fully integrated supply of dairy protein.
- Large production batches (up to 8MT) reduce inbound material evaluation costs.
- FSSC 22000-Q certification ensures the highest level of quality and documentation.
- All products are Kosher and Halal suitable.

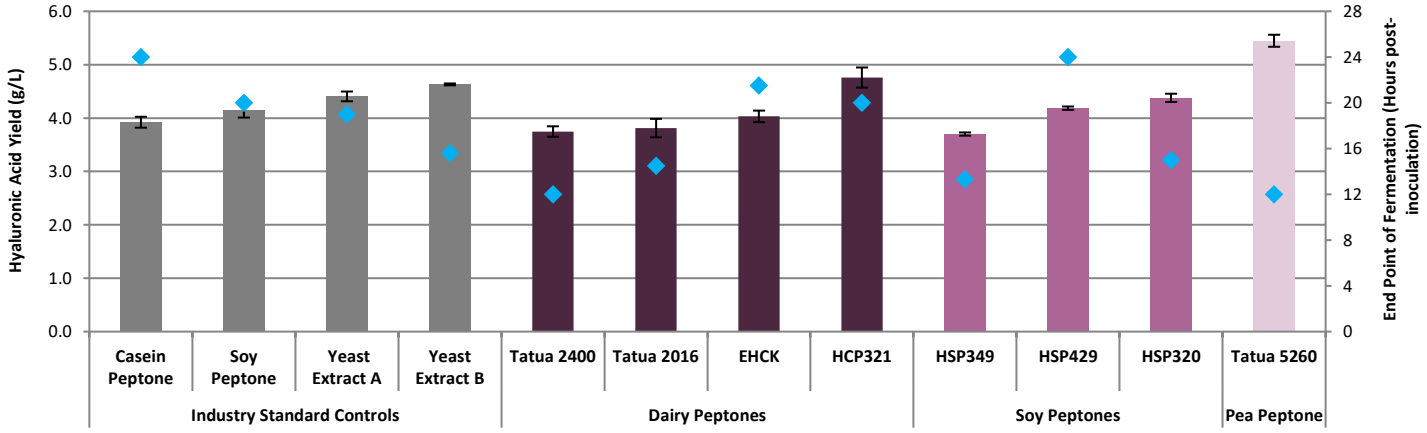
Tatua's Peptone Performance

Tatua peptones and industry standard controls were prepared in a fermenter medium at 1.0% (w/v) peptone, 0.75% yeast extract, 8.0% dextrose, 0.07% $MgSO_4$, 0.50% NaCl, 0.25% K_2HPO_4, 0.04% glutamine, and 0.06% glutamic acid (Im, et al. 2009). Following autoclaving, 500g/L of sterile dextrose solution was added.

Fermenters were inoculated at 5% v/v inoculation with an 8-hour culture of wild-type *Streptococcus equi zooepidemicus* (JK Strain) and allowed to ferment for up to 24 hours. Temperature was controlled at 37°C and pH controlled at pH 7.0 with sodium hydroxide solution. Agitation was set to 400rpm, and sparging was not used in order to maintain a microaerophilic environment.

Samples of the fermentation broth were taken every two hours starting from 16 hours post-inoculation until the end of the fermentation process, and processed immediately for hyaluronic quantification via modified CTAB assay (Oueslati et al, 2014).

Hyaluronic Acid Yield and End Point of Fermentation for Tatua Peptones and Industry Standard Controls



Conclusion

Overall, Tatua 5260 pea peptone demonstrated the highest hyaluronic acid titre (5.45g/L), and the shortest time to endpoint of fermentation (11.6hr). Tatua HCP321 casein peptone demonstrated the second highest titre (4.76g/L), and a shorter time to endpoint of fermentation (18.4hr) compared to industry standard casein peptone. Tatua HSP320 soy peptone demonstrated superior titre (4.38g/L) and fermentation time (14.9hr) to industry standard soy peptones, and comparable titre and fermentation time to industry standard yeast extracts. Tatua peptones provide beneficial options when optimizing growth media components for hyaluronic acid production.

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