



FOOD INDUSTRY

Food Processing Microbial Reduction Case Study

Montecchio di Crosara, Italy

HydroFLOW® i45 reduced microbial load across multiple species in fermented pepper concentrate, achieving up to 99.95% reduction after 21 hours of treatment.

99.95%

E. coli Reduction

99.6%

CMT Reduction

99.5%

Enterococci Reduction

21 Hrs

Treatment Time

BEFORE & AFTER

BEFORE

- Pepper concentrate fermented for 24 hours
- Microbial load reached 10⁷–10⁸ CFU/ml
- Preservative-free reuse required

AFTER

- ✓ E. coli reduced by 99.95%
- ✓ Enterococci reduced by 99.5%
- ✓ CMT reduced by 99.6%

OVERVIEW

Cesarin S.p.A. is a leading Italian producer of fruit and vegetable ingredients. The company wanted to evaluate whether sugary syrup from fruit candying could be reused without preservatives while maintaining organic product quality. A stress test was conducted on fermented pepper concentrate to assess the antimicrobial effectiveness of HydroFLOW® treatment.

CHALLENGE

Cesarin needed to reduce microbial load in fermented concentrate while supporting preservative-free reuse and maintaining product quality.

- Sugary syrup needed reuse without added preservatives
- Organic product quality had to be maintained
- Pepper concentrate was fermented for 24 hours
- Starting microbial load reached 10⁷ to 10⁸ CFU/ml

SOLUTION

A *HydroFLOW*® i45 was installed on the pump suction pipe of a 300L pilot recirculation system treating fermented pepper concentrate.

UNIT INSTALLED

1x *HydroFLOW*® i45

INSTALLATION POINT

Pump suction pipe section

PILOT SYSTEM

300L tank with recirculation pump

TREATMENT TIME

21 hours



SYSTEM

300L pilot storage tank



PIPEWORK

Pump recirculation pipework



INSTALLATION

HydroFLOW® i45 on suction pipe

RESULTS

% 99.95% *E. coli* Reduction

E. coli fell from 2.00×10^4 to 1.00×10^1 CFU/ml.

99.6% CMT Reduction

CMT reduced from 5.00×10^8 to 2.00×10^4 CFU/ml.

99.5% Enterococci Reduction

Enterococci decreased from 4.00×10^7 to 2.00×10^5 CFU/ml.

96.6% Coliforms Reduction

Coliforms reduced from 3.00×10^5 to 1.00×10^4 CFU/ml.

87.99% Yeasts Reduction

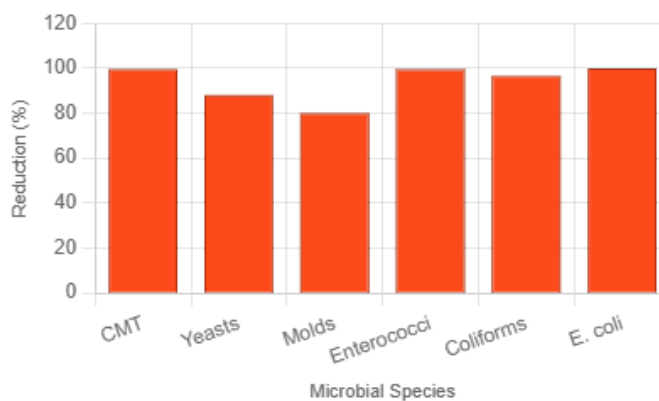
Yeasts reduced from 5.00×10^8 to 6.00×10^5 CFU/ml.

80% Molds Reduction

Molds reduced from 5.00×10^4 to 1.00×10^4 CFU/ml.

GRAPHS

Microbial Reduction After 21 Hours



Reduction rates measured by Cesarin Spa's in-house laboratory after 21 hours of *HydroFLOW*® i45 treatment.

KEY TAKEAWAY**Summary**

Cesarin S.p.A. evaluated *HydroFLOW*® i45 under stress test conditions using fermented pepper concentrate in a 300L pilot recirculation system. Following 21 hours of treatment, laboratory testing recorded significant reductions across all measured microbial species, including 99.95% *E. coli*, 99.6% CMT and 99.5% Enterococci reductions.

99.95%

E. COLI REDUCTION

99.6%

CMT REDUCTION

21 Hrs

TREATMENT TIME

**ADDITIONAL PHOTO EVIDENCE****SYSTEM***Fermented pepper concentrate sample***PRODUCT***Pepper concentrate in pilot system*

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