Ultra-high Density Culture System of the Rotifer, 
*Brachionus rotundiformis*

A Novel Culture System for Ultra-high Density Rotifer Production

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Flow Chart of the Development of High Density Culture Method of Rotifer in Japan

**Primary Inhibitor**
- Insufficiency of food
  - Condensed food
  - Density: $x \times 10^3$ ind./ml

**Other Inhibitors**
- Low DO Level
  - High purity oxygen
- Toxicity of Ammonia
  - pH control

**Establishment of High Density Culture**
- Density: $x \times 10^4$ ind./ml
Comparison of the Dietary Value for Rotifer

*Nannochloropsis* $\Phi 2-6 \mu m$

Freshwater *Chlorella* $\Phi 3-10 \mu m$

![Graph showing the comparison of rotifer density for different cultures.](image)
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Toxicity of Ammonia
  pH control

Establishment of High Density Culture
Density: $\times 10^4$ ind./ml
Semi-continuous Culture in 1 kl tank
(S-type rotifer, 50%-harvest/day)
A: Densities of rotifer and its egg (n=5)
B: PV of rotifer and egg-shell (n=5)
C: Dry weight of rotifer (n=3)

A: Rotifer Density
- Rotifer Density
- Egg Density

Density (x10^3/ml)

B: PV of Egg-shell
- PV of Egg-shell
- PV of Rotifer

PV (ml/l)

C: Dry Weight (mg/ml)

Dry Weight (mg/ml)

Culture Period (Day)
0 2 4 6 8 10 12 14 16 18 20
Fig. Diagram of the novel culture system for ultra-high density production of rotifer, *Brachionus rotundiformis*
Fig. Effect of filtering culture medium on population growth, DO and NH$_4$-N levels.
Fig. Effect of filtering culture medium on population growth, DO and NH₄-N levels.
Fig. Effect of filtering culture medium on the concentrations of phosphate, nitrite, and nitrate. Also the amount of supernatant extracted on each day is represented below.
Summary

1. A novel culture system for ultra-high density production of rotifer using porous membrane filters was developed.

2. By filtering culture water in this system, the concentration of ammonia was maintained continually at low level.

3. A very high-density culture result (160,000 rotifer/ml) was obtained on the 4th day after the inoculation of 20,000 r./ml.

4. Problems: forming of culture medium, fouling on filters, reliability of hardware.