Multi component food products – the next evolutionary step in 3D food printing?

J. Heringlehner, T. Dufter, H. Gruber, A. Jaeger, A. Knaeulein, T. Loetzbeyer, E. Schlosser
Challenges in 3 D Food Printing for Professionals

- Too slow printing speed for catering or gastronomy
- Most food products are build up from multiple components
- Multi component 3D food print essential for personalization other than appearance
Development of a Multiple Head 3D Food Printer

First Functional Model

Second Functional Model

First Prototype
Multihead 3D Food Printing Technologies

- Parallel Multihead Printing
- Multiple Component Printing
## Parallel Multihead Printing

<table>
<thead>
<tr>
<th>Number of printing heads</th>
<th>Printing Speed</th>
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<tbody>
<tr>
<td>1</td>
<td>1 x</td>
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<tr>
<td>2</td>
<td>2 x</td>
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<tr>
<td>4</td>
<td>4 x</td>
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<tr>
<td>6</td>
<td>6 x</td>
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</tbody>
</table>
First Parallel Dual Extrusion of Marzipan

3D food print of 2 marzipan owls
Personalized Small Series Printing
Parallel Multihead Printing

- Printing several objects within one print job
- Multiplication of print speed by additional printing heads
- Large printing area needed

⇒ Meanwhile up to 200 Choco objects have successfully been printed within 90 minutes (Dual Head 3D Food Printer)
Multihead 3D Food Printing Technologies

- Multihead 3D Food Printing
  - Parallel Multihead Printing
  - Multiple Component Printing
Multicomponent Printing with different colors
Multicomponent Printing of different Food Compounds

- Food puree
- Printing head
- Oil
Multicomponent Printing of different Food Compounds

3D food print of oil in carrot puree
Multicomponent 3D Food Printing

- Printing multicomponent objects within one print job
- Enabling the creation of innovative complex food products
- Personalized nutrient enrichment with oil, protein, vitamins or minerals
Summary

• Multihead 3D food printing may essentially speed up the printing process

• Multihead 3D food printing will enable the printing of multicomponent food objects

• Major challenges for the future will be the realization of easy to use applications for both use cases and the creation of stable food textures like emulsions, foams or micro suspensions
Acknowledgements

Contact:
Johannes Heringlehner
Institut fuer Lebensmitteltechnologie
Am Staudengarten 11
85354 Freising
Email:
johannes.heringlehner@hswt.de
The End