

## Design and production of food processing machine using under water shock wave for practical application

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A food processing machine that generates underwater shock waves has been developed at OkNCT. The processing method uses a spalling phenomenon, which is different from the conventional processing method. The processing effects are improvement of extractability, softening and sterilization without heating. In this report, the following contents are reported: The processing mechanism of the spalling phenomenon by underwater shock wave and the optical observation of shock wave, The processing method of this device, result that some food was processed experimentally by this device. The summary of consecutive driving devices for practical use when a shock wave goes through the plant, it is divided

into reflection and transmission wave in the interface of the difference of density. Tension power occurs in this interface. Then, the food is crashed by this phenomenon. Figure 1 shows a food processing machine for test crashing using underwater shock wave. The device consists of a power supply, a processing unit. The pressure vessel in the processing unit is filled with water and electrode of two sets are installed in centre of vessel. Electric energy charged in a condenser is supplied to an electrode by a gap switch and a shock wave occurs with electric collapse. The food is covered by a silicone hose and it is crushed in the atmosphere. Several foods were crushed by this device and inspected for the processing effect. Results such as the milling flour of rice and the coffee, softening of a meat, carrot, apple and the sterilization of powder is introduced. Developed consecutive operation processing device on which practical use was possible.

### Biography

Ken Shimojima persuaded his Doctorate and worked as an Assistant Professor at Tokyo Denki University, Japan during 2004 and then he worked as an Assistant Professor at Sophia University, Japan from 2004 to 2009. Now he is working as an Associate Professor at National Institute of Technology, Okinawa College, Japan since 2009.

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