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ONLINE ISSN : 1881-3984

PRINT ISSN : 1344-6606

## Food Science and Technology Research

Vol. 7 (2001) , No. 1 pp.78-83


[\[PDF \(108K\)\]](#) [\[References\]](#)

### Preparation of W/O/W Multiple Emulsions with Polymers in the Outer Aqueous Phase

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(Received: August 12, 2000)

(Accepted: November 10, 2000)

Conditions for preparing W/O/W emulsions with a polymer in the aqueous phase as a possible entrapping agent to produce powdery multiple emulsions were investigated for food applications of W/O/W emulsions. The stability of these emulsions prepared using various types of emulsifiers was evaluated by the encapsulation efficiency of a hydrophilic marker molecule in the inner aqueous phase. Combinations of hexaglycerin polyricinoleate (Sunsoft 818SX) and soybean lecithin or gum arabic used in the first and second emulsification steps were suitable to prepare stable W/O/W emulsions. Emulsions containing 10% (w/v) polymers in the outer aqueous phase were successfully prepared using these emulsifier pairs by adding the polymers to the emulsions after homogenization. Addition of polymer to the inner aqueous phase did not have a significant effect on emulsion stability in spite of expected alleviation of osmotic pressure difference between the inner and outer aqueous phases.

**Keywords:** [W/O/W emulsion](#), [encapsulation efficiency](#), [surfactant](#), [polymer](#)


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To cite this article:

**Preparation of W/O/W Multiple Emulsions with Polymers in the Outer Aqueous**

**Phase** Kaoru MUSASHINO, Yuri HASEGAWA, Hanaho IMAOKA, Shuji ADACHI and Ryuichi MATSUNO, *FSTR*. Vol. **7**, 78-83. (2001) .

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doi:10.3136/fstr.7.78

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