

F-35

Protein particles in soymilk and its role in controlling the quality of tofu

Shuntang Guo, China Agricultural University, Beijing, China

*Yangling Wan**, China Agricultural University, Beijing, China

Protein particles or particulate proteins (diameter > 40 nm) are formed from aggregation of dissociated soy protein subunits during heating of the raw soymilk (95°C, 10 min). We have proposed a model describing the formation mechanism of protein particles. The β subunit of β -conglycinin (7S) and basic (B) subunits of glycinin (11S) electrostatically interact and form the hydrophobic core of particulate proteins, where B subunits are covalently linked through disulfide bonds. Other hydrophilic subunits, such as α' / α of 7S, and acidic (A) subunits of 11S, are located around the hydrophobic core through hydrophobic interactions and hydrogen bonding. Parts of the whey soybean proteins, such as lipoxygenase, β -amylase, and lectin except Kunitz trypsin inhibitor (KTI) are also involved in the formation of protein particles. During the soymilk curdling induced by Ca^{2+} , firstly, small molecules (polyacid anions, mainly phytate) interact with Ca^{2+} and form unionizable substances; then soluble protein interact with Ca^{2+} to form new particles. Finally, aggregation and accumulation of all the protein particles lead to the formation of the gel network. There is a significant positive correlation between the content of protein particles and the hardness of tofu curds. By selecting the soybean cultivars with high 11S/7S ratio, or improving the heating temperature (115°C, 10 min), the protein particle content in soymilk will increase, with which the tofu curds with better texture characteristics can be obtained.