

มีความหนักมากขึ้น และค่าเฉลี่ยของ $\ln(\text{EMG})$ ของอาสาสมัครเพศชายมีค่ามากกว่าค่าเฉลี่ยของ $\ln(\text{EMG})$ ของอาสาสมัครเพศหญิง ซึ่งจากงานวิจัยสามารถสรุปได้ว่าความหนักของอาหาร ความเร็วของอาหาร เพศ และอายุ มีผลต่อการกลืนในมนุษย์ ในการรักษาผู้ป่วยโดยการให้อาหาร ผู้ป่วยรับประทานจำเป็นต้องมีการทดลองในผู้ป่วยก่อน เพื่อหาอาหารที่เหมาะสมกับผู้ป่วยแต่ละประเภท

Thesis Title	Effects of Rheological Properties of Food on Surface Electromyography of Tongue and Thyrohyoid Muscles during Swallowing in Volunteers
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Abstract

Dysphagia in human results from aging of organs. Surface electromyography is a good method for dysphagic diagnosis since it does not intrude the body of patient. In addition, changing of rheological properties of food can be employed to develop food for dysphagic patients. Viscosity of food is an important rheological property in studying of swallowing of patients. In this work, relationship between food viscosity and surface electromyography of tongue and thyrohyoid muscles was mathematically modeled. The results will benefit the studying of appropriate food preparation for dysphagic patients with different symptoms. Studying method was separated into 3 steps, 1) rheological properties of food were studied and several types of mixed ingredient food were prepared for swallowing experiment, 2) surface electromyography signals were acquired, and 3) relationship between food viscosity and surface electromyography signals was analyzed. Experiment results show that most types of single ingredient food are Non-Newtonian fluids except water and gelatin at 37 °C. Eight different types of mixed ingredient food were prepared. These are classified into main food and dessert. Main food consists of corn soup, noodle, rice porridge, and soymilk. Desserts are green tea, sweet taro, sweet pumpkin, and strawberry jam. Each type of the food has 3 formulas with different viscosities. All four types of main food were chosen for swallowing experiment in volunteers. The results from swallowing experiment indicate that relationship between $\ln(R_e)$ and $\ln(EMG)$ is linear with negative slopes. Mean values of $\ln(EMG)$ increase when food viscosities increase. The R- squared values decrease when food viscosities increase. It can be concluded that food viscosity as well as velocity affect swallowing in human. In order to give appropriate food for dysphagic patients, more experiments in the patients must be conducted.