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Recent approaches in physical modification of protein functionality

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## ACCEPTED MANUSCRIPT

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7	Abstract
8	Today, there is a growing demand for novel technologies, such as high hydrostatic
9	pressure, irradiation, ultrasound, filtration, supercritical carbon dioxide, plasma technology,
10	and electrical methods, which are not based on chemicals or heat treatment for modifying
11	ingredient functionality and extending product shelf life. Proteins are essential components in
12	many food processes, and provide various functions in food quality and stability. They can
13	create interfacial films that stabilize emulsions and foams as well as interact to make
14	networks that play key roles in gel and edible film production. These properties of protein are
15	referred to as 'protein functionality', because they can be modified by different processing.
16	The common protein modification (chemical, enzymatic and physical) methods have strong
17	effects on the structure and functionality of food proteins. Furthermore, novel technologies
18	can modify protein structure and functional properties that will be reviewed in this study.
19	Key words: Functional properties, ultrasound, microwave, supercritical carbon dioxide, cold
20	plasma treatment.
21	1. Introduction
22	Functional properties represent complex interactions between the conformation,
23	structure, composition and physicochemical properties of proteins under the influence of
24	other food components and environment (Klompong, Benjakul, Kantachote, & Shahidi,

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