

ภาคผนวก

เอกสารอ้างอิง

พระราชบัญญัติอาหาร พ.ศ. 2522 สำนักงานคณะกรรมการอาหารและยา กระทรวงสาธารณสุข

ศิวาพร ศิวเวช 2535. วัตถุเจือปนในผลิตภัณฑ์อาหาร. โรงพิมพ์ศูนย์ส่งเสริมและฝึกอบรม
การเกษตรแห่งชาติ. มหาวิทยาลัยเกษตรศาสตร์ นครปฐม.

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Output จากโครงการวิจัยที่ได้รับทุนจาก สกว.

1. ผลงานตีพิมพ์ในวารสารวิชาการนานาชาติ ตามที่คาดไว้ในสัญญาโครงการ
 - ชื่อเรื่อง Applications of allicin-chitosan complex as antimicrobial agent in low fat pork sausage and its effect on product quality and shelf life ซึ่งอยู่ระหว่างการเขียนและตรวจแก้ เพื่อส่ง submit ในวารสาร Meat Science หรือ International Journal of Food Science and Technology ต่อไป
2. การนำผลงานวิจัยไปใช้ประโยชน์
 - เชิงวิชาการ (มีการพัฒนาการเรียนการสอน/สร้างนักวิจัยใหม่)
3. อื่นๆ
 - การเสนอผลงานภาคบรรยาย (Oral presentation) ในงานประชุมวิชาการ The 10th International Hydrocolloids Conference ณ Shanghai Jiao Tong University (SJTU), Shanghai ประเทศจีน ระหว่างวันที่ 19-24 มิถุนายน 2553



10th International Hydrocolloids Conference

20 – 24 June 2010, Minhang Campus, Shanghai Jiao Tong University
Shanghai, China

March 9, 2010

Dr. Tantawan Pirak
Department of Product Development,
Faculty of Agro-Industry,
Kasetsart University,
Chatuchak, Bangkok,
Thailand 10900

Dear Dr. Tantawan Pirak ,

On behalf of the Organising Committee of the 10th International Hydrocolloids Conference, we cordially invite you to attend our conference, to be held from 20th to 24th June 2010 at Shanghai Jiao Tong University in Shanghai, China.

I am pleased to inform you that your application for oral presentation entitled, "Production of Chitosan-Allicin Complexes for Using as Antimicrobial Agent: Preparation Method, Properties and Microstructure" has been accepted to present at the conference.

Please proceed to register for the conference via the conference website (<http://www.10ihc.org>). More details on the conference program and accommodation are also posted on the same website. We hope that you will be able to join us for the Conference and participate in our program.

We look forward to meeting you at the conference in Shanghai.

Yours sincerely,

Hongbin Zhang

Chairman, and on behalf of the Organising Committee

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Production of Chitosan-Allicin Complexes for Using as Antimicrobial Agent: Preparation Method, Properties and Microstructure

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The appropriate preparation method, physical and chemical properties, microstructure and antimicrobial activity of chitosan-allicin complexes was investigated in this study. Chitosan was prepared from dried and cleaned shrimp shells with the following processes: deproteinization, demineralization, decoloration and deacetylation, respectively. The deacetylation step was performed by soaking chitin into 50%w/w sodium hydroxide solution at room temperature for 72 hr and heating to 90°C for 24 and 48 hr, in order to receive chitosan with 78% degree of deacetylation (%DD) (molecular weight (MW) at 1,100 kDal) and 94% DD (MW at 1,039 kDal), respectively. Allicin was extracted from fresh garlic and determined concentration using HPLC. The obtained allicin solution was freshly used or kept in refrigerator at 4°C and used within 1 week. The chitosan-allicin complexes were prepared by stirring allicin solution with homogenizer at 11,000 rpm, continuous pouring chitosan solution until completely mix and then continuous stirring for 1 min. The obtained complex solution was leaved at 4°C for 48 hr in order to complete the complexation step. The result showed that the obtained complex solution possessed 20-21% total soluble solid with pH at 4.5-4.8. The increase of chitosan solution resulted in coagulating of chitosan droplet. The optimum chitosan to allicin weight ratio was 1:1. The percentage of production yield obtained from 4 different drying methods (freeze drying, spray drying, vacuum drying and tray drying) was 66.37, 37.84, 8.02, and 5.11, respectively. The obtained chitosan-allicin complexes exhibited light yellow color which had the L* in between 81.0-87.3, a* in between 0.4-2.2 and b* in between 16.8-21.2, respectively. The result from scanning electron microscope revealed that the shape of the obtained complex was round and the size of complex was vary in the range of 5-15 µm. The functional groups resulted from Fourier-Transform Infrared Spectroscopy (FT-IR) showed that the chitosan-allicin complexes possessed 4 main functional groups, including alkyl group, alkyl group-hydroxy or possibly amino substituent, hydroxyl or amino compound, and aliphatic alcohol with carbonyl substitution. The results from single X-ray diffraction showed that the crystallinity of chitosan-allicin complexes was amorphous. The preliminary results from disk diffusion test revealed that chitosan-allicin complexes exhibited the antibacterial activity against spoilage bacteria and had the possibility to be used as antimicrobial agent in foods.



