

Development of oat drink for protection of gastric mucosa

1. Title of Research : Development of oat drink for protection of gastric mucosa

2. Cross-School Research and

Development Team Members

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3. Content of Cross-School Research and

Development

This project was performed and cooperated with the Department of Food Science, National Penghu University of Science and Technology and Li Chuan Aquafarm Co., Ltd. to develop an oat drink and investigate its protective effect on indomethacin-induced gastric mucosal damage in rats. Overall, we expected that the results of the implementation of this project can be used as a basis for the development of oat drink for health food that protects the gastric mucosa.

4. Description of Industrial Needs and

Research Result Applications

The global market of oat drinks increases from US\$2.76 billion in 2022 to US\$3.05 billion in 2023, with a compound annual growth rate (CAGR) of 10.3%. The global market size of oatmeal drinks is forecast to reach US\$4.21 billion by 2027, equivalent to a CAGR of 8.4%. It shows that oatmeal drinks have huge market value and forward-looking for the current society. According to the statistic results released by the Ministry of Health and Welfare of the Executive Yuan in 2023, gastric cancer ranks 8th among the top 10 causes of cancer death among Taiwanese people in 2022. It indicates that gastric health is an important issue that cannot be ignored by modern people. Gastric mucosa is the first line of defense against toxic substances. Long-term exposure to toxic substances can lead to gastric bleeding, ulcers and perforation. The causes of gastrointestinal mucosal damage are due to an imbalance between aggressive factors (nonsteroidal anti-inflammatory drugs, alcohol, psychological stress, *Helicobacter pylori* infection, and excessive secretion of gastric acid, pepsin and bile acids) and protective factors (mucin glycoproteins, bicarbonate

secretion, and prostaglandin synthase) . In modern society, more than 30 million people take nonsteroidal anti-inflammatory drugs (NSAIDs) every day to relieve pain and reduce inflammation symptoms. Indomethacin is a common NSAID, which achieves anti-inflammatory and analgesic effects by inhibiting the activity of cyclooxygenase (COX) . However, in the past few decades, several studies have shown that indomethacin can lead to hypersecretion of gastric acid and production of reactive oxygen species (ROS), and interfere with the regeneration of mucosal cells, which has adverse effects on the gastric mucosa. Therefore, it is extremely important to develop nutritional supplements that can improve gastric mucosal damage caused by indomethacin, and it also occupies an important position in market demand. The results of this project will definitely increase the market value of developing oat drink as a health food to protect gastric mucosa in the future.

5. Performance of Cross-School Research and Development

Through the implementation of this project, one undergraduate student and one graduate student were instructed. One practical project and one master's thesis were completed.



Fig 1 : Bottled Oat Guard Drink.



Fig 2 : Sterilized oat drink.

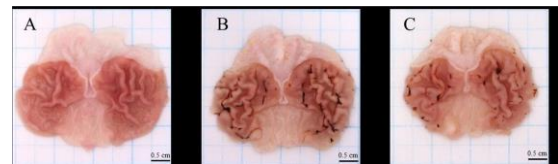


Fig 3 : The indomethacin-induced gastric ulcers in rats were significantly improved after Oat Guard Drink treatment.