

Research on Value Added Properties of Thai Rice



Thai Rice

Rice is a major dietary staple for large populations, especially in Asian countries. Thailand also exports rice to other countries at the top five levels. In Thailand, rice is grown in the fields throughout the country especially in the central, north and north-east areas. Rice contains high levels of elements such as calcium, magnesium, iron, and copper. However, rice is normally grown in watery conditions and known to have a high capability for taking up arsenic (As), in forms both naturally occurring and added by human (as fertilizer), from soil and water.

At present, the standard limit value of As in rice has been reviewed by Codex Alimentarius and the values were changed to be 0.2 mg/kg for inorganic As in polished rice and 0.35 mg/kg in unpolished rice. These standard values may affect the quality of Thai rice for export. Therefore, it is important to have a standard analytical method for determination of As and its species (inorganic and organic As) in rice samples. This method should be precise and accurate for determination of As at low levels. In addition, technology or water management for growing rice should be developed to reduce As absorption into rice plant.



Development of analytical method for As speciation and technology for rice growing

This research developed the analytical method for determination for As and other elements in rice samples especially inorganic As which is found as major As species in Thai rice. However, our results indicated that most of Thai rice samples contained As levels lower than the standard limited value for inorganic As in polished rice (0.2 mg/kg) set by Codex Alimentarius. This analytical method is precise and accurate and can be used to determine As levels in different rice types. Moreover, we have a collaboration with Suphan Buri Rice Research Center to develop new technology for growing rice to decrease As absorption. Water management such as wet-dry process can help not only to reduce the use of water, but also to decrease As absorption into rice plant. This technology will be used for growing rice in the field and it will help the farmers to get high quality of rice.

Application of research

1. The data on As levels in Thai rice samples will be published and these will help rice exporters to confirm the quality and safety of Thai rice. In addition, our researcher was also in a team with Department of Foreign Trade, Ministry of Commerce to visit Food Institute in Denmark and Belgium to explain and give information on As levels in Thai rice. This will increase the consumer confidence for consumption of Thai rice.
2. Chulabhorn Research Institute is on the way in the preparation for the accreditation of ISO/IEC 17025 standard laboratory for determination of elements such as total arsenic, cadmium, lead, copper, iron and manganese in rice samples. This will help rice exporters to confirm the quality of their rice for export.
3. Development of technology (wet-dry process) for growing rice to reduce As absorption will be useful for the farmers as it helps to reduce production cost but can maintain quality of rice.

