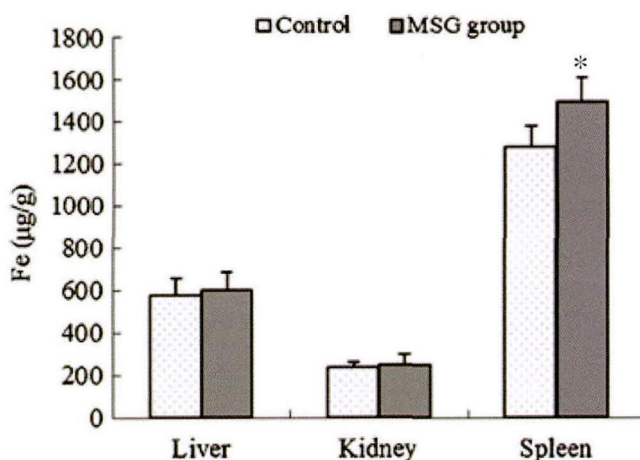


## The focus research of monosodium L-glutamate in animal nutrition

Monosodium L-glutamate (MSG) is a flavor enhancer and was first found by Ikeda in 1908. Then, MSG was broadly used in the food industry to enhance umami taste, especially in Asian countries including China. However, researches on MSG were relatively drab, and most of which focused on its neurotoxicity. Over the past 3 years, the research team led by Prof. Yin Yulong from the Institute of Subtropical Agriculture (ISA), Chinese Academy of Sciences, have contributed a great deal of knowledge to the understanding of MSG for swine nutrition and health, which has important practical values for feed industries worldwide. Their research was supported by the National Natural Science Foundation of China (Grant Nos. 31330075 and 31110103909).

This research team found that oral administration of MSG increases the expression of glutamate receptors and transporters in the gastrointestinal tract of piglets, and the expression profiles of hepatic genes related to lipid and nitrogen metabolism were also altered in suckling piglets (*Amino Acids*, **2014**, 46(1): 245—50.). They also found that (i) a large part of glutamate in MSG is metabolized by the intestine in pigs; (ii) at the dose used, MSG is, however, not entirely metabolized by the intestine; (iii) glutamate metabolism in pig intestine leads to aspartate and alanine production (*Journal of Food, Agriculture & Environment* (**2012**, 10: 600—5). As nutrients do not solely exist in animal diet, this team also investigated the interaction between MSG and other macronutrients, especially focusing on dietary fat. They found that although both dietary fat and MSG not only clearly influence amino acid content in tissues via different ways, but also enhance the absorption of amino acids in jejunum, no interaction exists between their effects (*PLoS One*, **2014**, 9(1): e84533). They also found that the dietary supplementation of both fat and MSG alters energy balance and food intake, and does enhance fat deposition in growing pigs in a solo way. Interestingly, dietary fat and MSG have an obvious antagonistical interaction on food intake regulation and energy balance maintenance in growing pigs (unpublished data). Another interesting finding is that MSG administration leads to a significant increase of Fe levels in the spleen (see Figure). Acute MSG does not affect the Fe levels in a short term, and the administration of MSG increases Fe retention by enhancing total iron-binding capacity in sera (*Biol Trace Elem Res*, **2013**, 153:191—5).



**Figure** Effect of the short-term MSG treatment on the Fe levels in pig tissues. \*  $P < 0.05$  denotes a significant difference between groups.