




**IRON FORTIFICATION OF MONOSODIUM GLUTAMATE WITH  
ASCORBIC ACID IN THE BIOAVAILABILITY OF FERROUS  
SULFATE AMONG ANEMIC SPRAGUE-DAWLEY RATS**



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### ABSTRACT

The potential role of monosodium glutamate (MSG) was investigated in determining the enhancement of absorption of ferrous sulfate ( $\text{FeSO}_4$ ) with ascorbic acid (C) among anemic female Sprague-Dawley rats. Hemoglobin repletion-depletion method was employed in determining the iron bioavailability and utilization. Sixty female Sprague-Dawley rats were anemia-induced and treated with iron (Fe), iron fortified in MSG (Fe-MSG) and in combination with ascorbic acid (Fe-MSG-C). After 6 weeks iron repletion, significant increase in hemoglobin and hematocrit levels ( $p < 0.05$ ) was prominent among anemic rats fed with iron diets (Fe, Fe-MSG and Fe-MSG-C) than the control. Generally, anemic rats utilized dietary iron during anemia state. Despite the enhancement, Fe-MSG and Fe-MSG-C diets had significant improvement compared to Fe supplementation although no significant variation was remarkable between both diets ( $p > 0.05$ ). The addition of ascorbic acid showed non-significant result on hematological indices. Consequently, the percent hemoglobin regeneration efficiency (%HRE) and iron utilization effects were greatest in rats fed with Fe-MSG diet, less (but significant) in rats fed with Fe diet and not significant in rats fed Fe-MSG-C diet. Fe-MSG mixtures enhanced iron bioavailability and utilization when fed to anemic rats, as indicated by the intermediate bioavailable of the Fe compound with the enhancer than the low bioavailability of Fe supplementation. Blood indices were elevated despite IDA condition suggesting development of macrocytosis. Fortification of monosodium glutamate as a condiment is feasible, although additional strategies such as using other micronutrient (iodine, calcium, zinc) in the fortification of monosodium glutamate should be considered to obtain the iron bioavailability in complete Filipino diet.



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