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Agricultural and Food Science - abstract



Vol. 11 (2002), No. 2, p. 137-141

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The effect of clinoptilolite on ¹³⁷Cs binding in broiler chickens

Keywords clinoptilolite, ¹³⁷Cs, sorption, broilers,

Abstract

The objective of this study was to evaluate the ¹³⁷Cs binding capacity of clinoptilolite. In the first in vitro experiment we studied the sorption of ¹³⁷Cs to natural and modified forms of clinoptilolite in highly acid solution, prepared to be similar to that of the stomach (pH =2.3) at 37 °C. In the second in vivo experiment ¹³⁷Cs binding to a modified form of clinoptilolite was studied in orally administered broiler chickens. ¹³⁷Cs sorption in the high acidity solution depended on clinoptilolite concentration and varied between 30-85% of initial activity. In the chickens, three hours after ¹³⁷Cs administration, there was 67% and 63% lower accumulation of ¹³⁷Cs in muscle and internal organs (respectively) and seven hours after ¹³⁷Cs administration, there was 69% and 49% lower accumulation of ¹³⁷Cs in meat and internal organs (respectively) compared to the controls with no clinoptilolite added in food. Natural and modified forms of clinoptilolite have a high sorption efficiency towards ¹³⁷Cs ions and could be recommended as possible radiocaesium binders in domestic animals.

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Update 24.7.2002.

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