

# RADIOACTIVE LEVELS AND DOSES OF $^3\text{H}$ AND $^{14}\text{C}$ IN WHITE SPIRITS

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White (and yeast) spirits is a general name for strong alcoholic beverages in China. The paper reports levels and doses of  $^3\text{H}$  and  $^{14}\text{C}$  in 65 spirits samples between 1986 and 1987. Experiments were made by measuring and analyzing each sample, using a low background liquid scintillation spectrometer.

Radioactive levels of 65 spirits samples are as follows:

Variant range of  $^3\text{H}$  activity is  $98.2 - 170.6 \text{ Bq} \cdot \text{dm}^{-3}$  and its average is  $149.2 \pm 17.3 \text{ Bq} \cdot \text{dm}^{-3}$ ; Variant range of  $^{14}\text{C}$  activity is  $38.8 - 80.2 \text{ Bq} \cdot \text{dm}^{-3}$  and its average is  $57.4 \pm 8.2 \text{ Bq} \cdot \text{dm}^{-3}$ .

If the man drinks  $200 \text{ cm}^3$  of spirits daily, the annual dose equivalents will be  $0.19 \text{ uSv}$  of  $^3\text{H}$  and  $2.5 \text{ uSv}$  of  $^{14}\text{C}$ .

In ordinary strong alcoholic beverages that contain 57-60% alcohol, the mean  $^3\text{H}$  and  $^{14}\text{C}$  activities are  $153.8 \text{ Bq} \cdot \text{dm}^{-3}$  and  $60.3 \text{ Bq} \cdot \text{dm}^{-3}$ , respectively, but in spirits of lower alcoholic content (38-40%), the mean  $^3\text{H}$  activity is  $114.6 \text{ Bq} \cdot \text{dm}^{-3}$ , that is 25.5% less than ordinary spirits, and the mean  $^{14}\text{C}$  activity is  $46.1 \text{ Bq} \cdot \text{dm}^{-3}$ , that is 23.5% less than ordinary spirits.

We compared the  $^3\text{H}$  and  $^{14}\text{C}$  contents of five kinds of staple grains from both Sichuan and Guangdong provinces. We learned that the level of  $^3\text{H}$  activity in spirits is ten times higher than in grains and water, and the level of  $^{14}\text{C}$  activity in spirits is equivalent to that in grains. White spirits has fully concentrated  $^3\text{H}$  and  $^{14}\text{C}$  from both grain and water, and activities increase with increasing alcoholic content.  $^3\text{H}$  in spirits probably is averaged from both water and grain, and  $^{14}\text{C}$  is averaged mostly from grain.