

NOTES

Enhanced Immunoglobulin M and Immunoglobulin G Antibody Titers in Mice Fed Selenium

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Mice fed diets supplemented with selenium (sodium selenite) immunologically respond to the sheep red blood cell antigen by producing enhanced immunoglobulin M and immunoglobulin G antibody titers.

Recently we reported that selenium (Se) (sodium selenite) significantly increased immunoglobulin (Ig) M anti-sheep red blood cell (SRBC) hemagglutinating titers in Swiss Webster mice fed commercial or Torula yeast diets (2). Se toxicity or Se deficiency produced titers approximately equal to or less than control mice.

This report confirms our previous observations and indicates that mice fed Se-supplemented diets also produce significantly increased IgG anti-SRBC hemagglutinating titers.

Weanling, female Swiss Webster mice were fed Purina chow supplemented with 0.25 to 9.5 ppm Se (sodium selenite) for 6 weeks. Mice were intraperitoneally injected with 0.2 ml of a 20% suspension of SRBC ($\sim 5 \times 10^8$ cells) in physiologically buffered (pH 7.2) saline. On days 4, 7, and 14 post-sensitization blood was collected from three mice in each dietary group by brachial bleeding. Anti-SRBC sera were assayed in duplicate for IgM and IgG antibody by the microtiter method (3). IgM and IgG were distinguished by mercaptoethanol treatment of the sera (1).

Previous results have shown that mice fed Purina chow or Torula yeast diets supplemented with 1 to 3 ppm Se (sodium selenite) possess IgM hemagglutinating titers greater than those of controls on days 4 and 7 post-SRBC sensitization (3). All mice fed Se-supplemented Purina chow, including those fed 9.5 ppm Se, possess in addition to greater IgM titers (Fig. 1) much larger IgG titers on day 14

post-SRBC sensitization (Fig. 2). Little IgG antibody was present on day 4 post-SRBC sensitization and was not measureable due to the initial dilution of sera. Most antibody present on day 14 post-SRBC sensitization was IgG since hemagglutinating antibody remained after mercaptoethanol treatment. Maximal IgM and IgG titers were observed again in mice fed diets containing approximately 1 to 3 ppm Se.

Diets containing 0.1 ppm Se are considered nutritionally adequate for the prevention of Se deficiency diseases. Results here suggest that diets which contain 1 to 3 ppm Se (sodium selenite) may potentiate the synthesis of circulating antibodies.

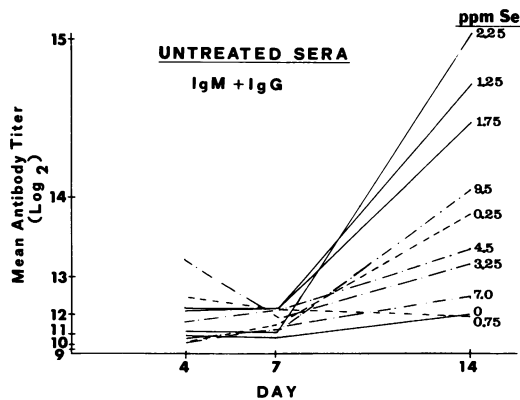
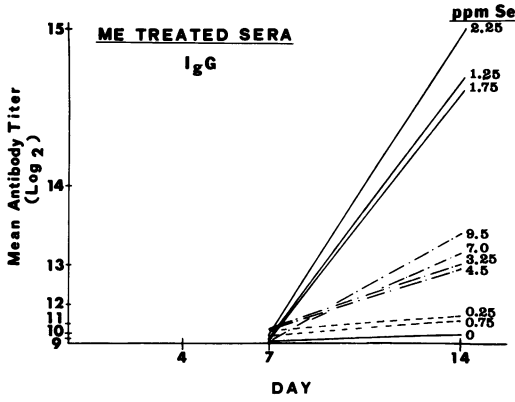


FIG. 1. Anti-SRBC hemagglutinating titers of normal mouse sera. Mice were fed diets containing graded levels of selenium (sodium selenite). Mean titers are values of three samples assayed in duplicate on days 4, 7, and 14 post-SRBC sensitization.



LITERATURE CITED

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FIG. 2. Anti-SRBC hemagglutinating titers of mercaptoethanol-treated sera of Fig. 1. Mean titers are values of three samples on days 4, 7, and 14 post-SRBC sensitization assayed in duplicate.