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STUDIES ON VIABILITY OF FROZEN-THAWED MOUSE EMBRYOS  
—EFFECTS OF FREEZING AND THAWING CONDITIONS  
AND SERUM CONCENTRATION IN FREEZING MEDIUM

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Eight-~16-cell embryos were frozen in 0.25ml plastic straws containing 0.2ml medium with 1.2M dimethylsulfoxide.

1. The effect of reciprocal action of freezing rate, temperature at transfer to liquid nitrogen and thawing method on the survival of mouse embryos was examined.

High survival rates of  $88.6 \pm 1.6$  and  $93.5 \pm 2.6\%$  were obtained when the embryos were cooled at  $0.5^\circ\text{C}/\text{min}$  to  $-60^\circ\text{C}$  or  $-70^\circ\text{C}$  before transfer to liquid nitrogen, and thawed by warm air from a hair drier. Embryos cooled at  $0.5^\circ\text{C}/\text{min}$  to  $-60^\circ\text{C}$  and thawed at room temperature after deep freezing in liquid nitrogen also showed a high survival rate of  $85.9 \pm 4.0\%$ . The survival rates among the three groups were not significantly different.

2. The effect of the concentration of fetal calf serum (FCS) in the freezing medium on the viability of mouse embryos after freezing and thawing was examined. Each sample was cooled at  $1.0^\circ\text{C}/\text{min}$  and thawed by warm air from a hair drier.

The highest survival rate ( $88.0 \pm 2.2\%$ ) was obtained when the embryos were frozen in 100% FCS. The survival rates of embryos frozen in medium containing 80 or 60% FCS were  $86.3 \pm 2.6$  and  $82.2 \pm 2.2\%$ , respectively. No significant difference was found in medium containing FCS in a concentration greater than 60%.