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SUPPRESSION OF B CELL DIFFERENTIATION BY
T CELLS DERIVED FROM NEONATAL CALVES

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This study was designed to examine the cellular basis of immunoglobulin (Ig) production in calves from birth to 90 days of age.

B lymphocytes were isolated by the panning method, and T lymphocytes were isolated by employing both the panning method and E-rosette sedimentation from peripheral blood lymphocytes (PBL) of neonatal calves and non-pregnant cattle.

The functional capacity of T and B lymphocytes of neonatal calves was investigated by *in vitro* methods using T lymphocyte-dependent polyclonal B lymphocyte activator of the pokeweed mitogen (PWM) system.

Only a few PBL from neonatal calves were differentiated into Ig-producing cells *in vitro* by PWM-stimulation. Newborn PBL suppressed differentiation of adult PBL into Ig-producing cells in the PWM system. This suppressive effect of newborn PBL was found to exist in a T-cell enriched population, and the suppressive activity of neonatal T lymphocytes was dose dependent to some extent.

To evaluate the ability of newborn B lymphocytes to become differentiated into Ig-producing cells, newborn B lymphocytes were co-cultured with T lymphocytes from neonatal calves and adult cattle in the PWM system. The addition of adult T lymphocytes enhanced differentiation of neonatal B lymphocytes into Ig-producing cells but not neonatal T lymphocytes.

The suppressor activity of T lymphocytes decreased gradually with advancing age, and such activity was not consistently demonstrated at 50 days of age or later.

The generation of Ig-producing cells in PBL from calves by PWM stimulation gradually increased with advancing age, while during the period of no suppressor activity, the amount of differentiated Ig-production cells of calves reached only one third of that of adults.