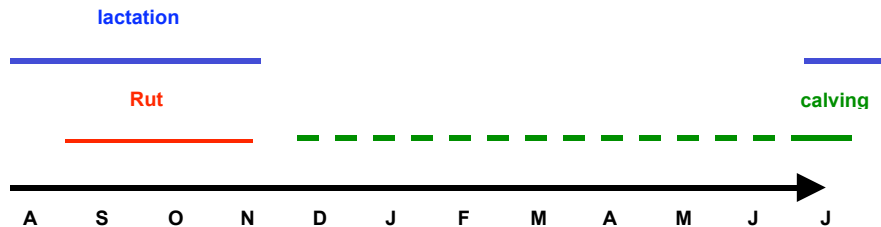


Bio 45 – Lect., 3-10 - Lessons from Red Deer

Revealing data from a long-term study of Red Deer lifetime reproductive success

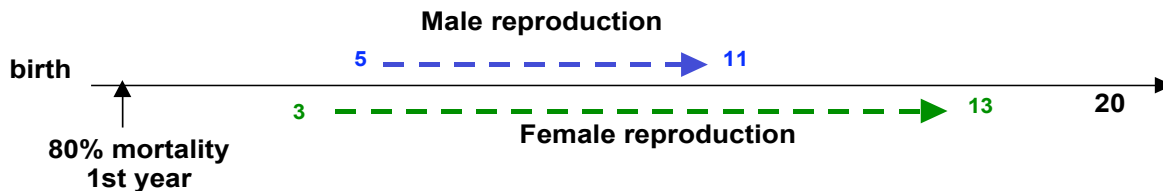
1. Social Structure and Dynamics

- most of year males and females live apart in groups.
- Ranges of related female groups often overlap
- RUT – Sept. – Nov. – stags join female groups try to keep other males away and add to their groups. Groups = male and 1-20+ females
- Bigger males hold bigger groups longer



2. Differences among males and females in what affects reproductive success

- males - proximate factors - access to females, "harem" size, fighting ability, lifespan
- males - ultimate factors - body size, early growth, maternal investment in 1st year
- females - proximate factors - lifespan, calf mortality, and fecundity
- female - ultimate factors - resource access as adult, size of matrilineal group



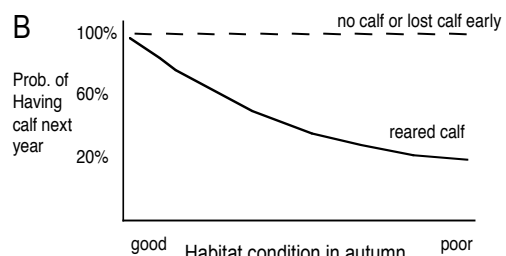
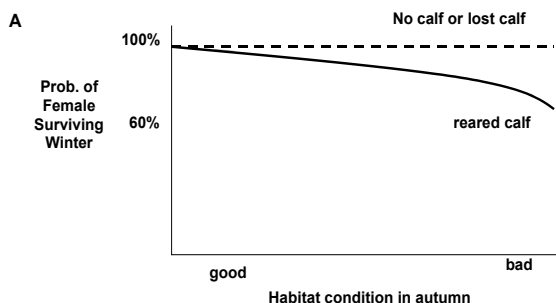
3. Costs of reproduction for:

A. Males - roaring and defense of females

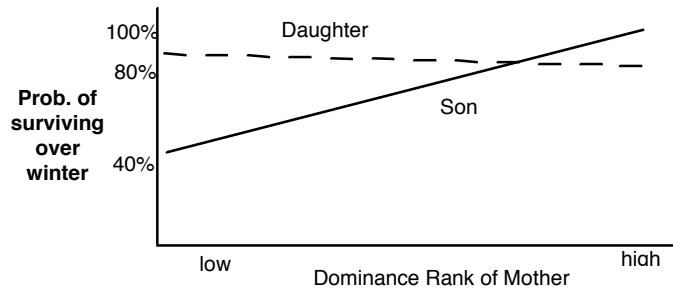
- Roaring by stags advances date of estrous in hinds - regular calling enhances male mating success, but extracts big cost
- "harem" tenure limited for stags by rapid loss of body condition
- Effective breeding lifespan of stags = 3-5 years between ages 6 and 11

B. Females - lactation - balancing own survival and that of offspring

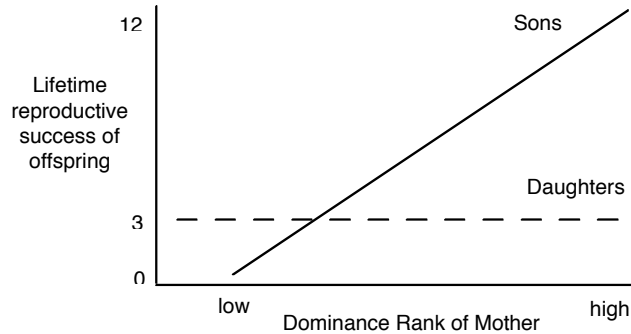
- Effective breeding lifespan of hinds can be up to 12 years - age 3-15+
- (Clutton-Brock, et.al. - Nature 337:260-262 - 1989) Costs of gestation and lactation are very high. Hinds in poor condition who try to breed may produce calf that dies in first winter and may also die themselves (A) or have to skip a year of breeding (B).



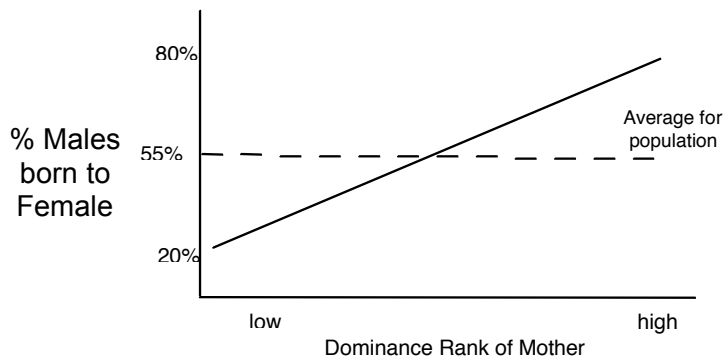
- Condition is related to forage quality (A & B) - varies with habitat and dominance.
- The cost of raising sons higher if female is subordinate. Little difference dominant:



- Gain through sons is also higher for dominant females



- So... If mothers could determine the sex of their offspring, what would you expect them to do? How would it be affected by the mother's dominance? Here are the data for red deer – how it works is not known...



In Sum: Females have considerable non-genetic influence -- make different investments in male and female offspring and seem to vary offspring sex ratio!!