

## Research Problem

Pastoralists in the Far North Region of Cameroon seem to manage sick animals in a paradoxical way: the literature describes the long term goal of pastoralists to be health and longevity of the herd (Krätli 2008; Mace 1993; Stenning 1958), but they frequently do not remove animals sick with chronic diseases, such as Brucellosis, that can affect fertility of animals and humans.



Fig. 1 Bonding between the future generations of cattle and people.

## Study Region



Map 1. Far North Region, Cameroon, Africa

## Models of disease and fertility

Herders make clear connections between disease and abortions in cattle.

But not all diseases were considered equally dangerous.

Herders were more likely to link trypanosomiasis with fertility problems than Brucellosis.

One reason may be that flies transmitting trypanosomiasis are visible, whereas Brucellosis bacteria are not.



Fig. 8 Microscopic image of *Brucella abortus*.



Fig. 9 Tsetse fly feeding on a cow.

## Fertility Rates & Brucellosis Prevalence

### Fertility Rates of Mobile vs. Sedentary Herds

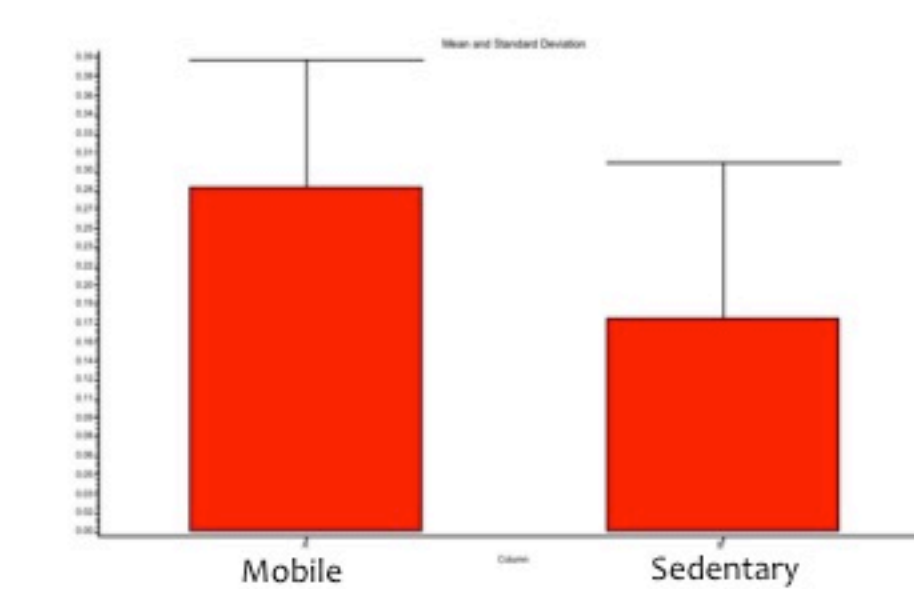


Chart 4 Unpaired T-test shows a statistically significant difference in the fertility rates between mobile and sedentary herds.

### Brucellosis Prevalence of Sedentary vs. Mobile Herds

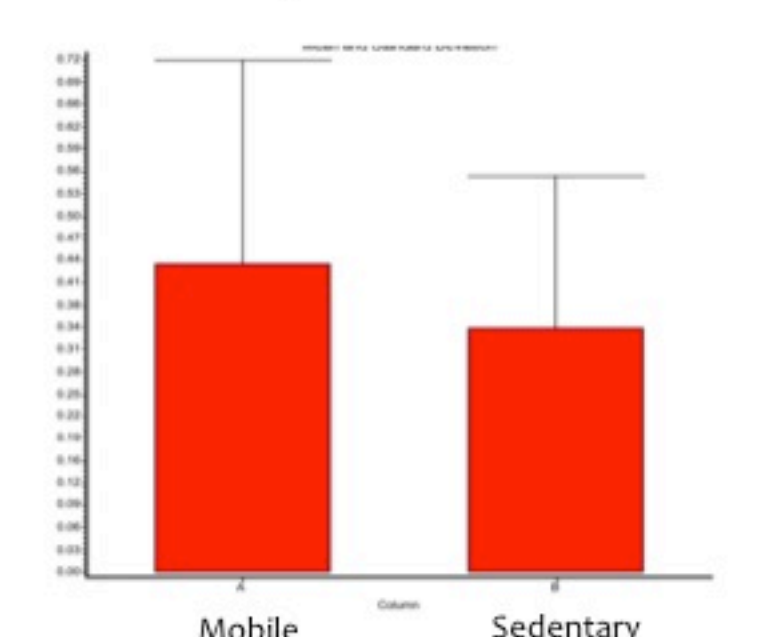


Chart 5 Unpaired T-test shows no statistically significant difference in Brucellosis prevalence between mobile and sedentary herds.

## Research Questions

1. Why do herders keep chronically sick animals in their herds?
2. What impact does keeping sick animals in the herd have on herd fertility?



Fig. 2 Cattle waiting for their morning milking.

## Why keep sick animals?

Herders keep sick animals in their herd due to rational, economic reasons.

Social stigmas against selling sick animals prevent herders from getting a good price on a sick animal at market.

Herders choose to sell the animal only when the animal is either:

- a) terminally ill, or
- b) between periods of illness when the animals appears most healthy.



Fig. 7 The most fashionable calf on the rope; the cloth helps to protect the young calf from flies.

## Management of animal diseases

Nearly all herders interviewed said that their first action when they have a sick animal in their herd is to administer veterinary drugs.

Three most common drugs purchased by mobile and sedentary herders are oxy (oxytetracycline), oli, and Veriben.

Some mobile herders also mentioned the use of "fire" or cauterization to treat sick animals.



Fig. 10 The local pharmacy; human and animal drugs for sale at a market.

## Methodology

Using an ethnographic approach, semi-structured interviews were conducted with 21 herds.

During each interview, herd fertility was assessed by asking health and reproductive questions about each calf and its mother on the family's calf rope.

Using grounded theory each interview was transcribed, the herders' responses coded, and then sorted to understand cultural systems in place regarding treatment of sick animals, disease-fertility relationships, and decision-making process of selling animals.

Fertility statistics were compared to previously collected Brucellosis prevalence samples to analyze the possible impact that keeping sick animals in a herd has on herd fertility.



Fig. 3 Newest members on a family's calf rope.



Fig. 4 Researcher and translator, Moussa, conducting an interview in the field. (photo credit: Adrian Proffitts)

## Decision-Making Process of Selling Animals

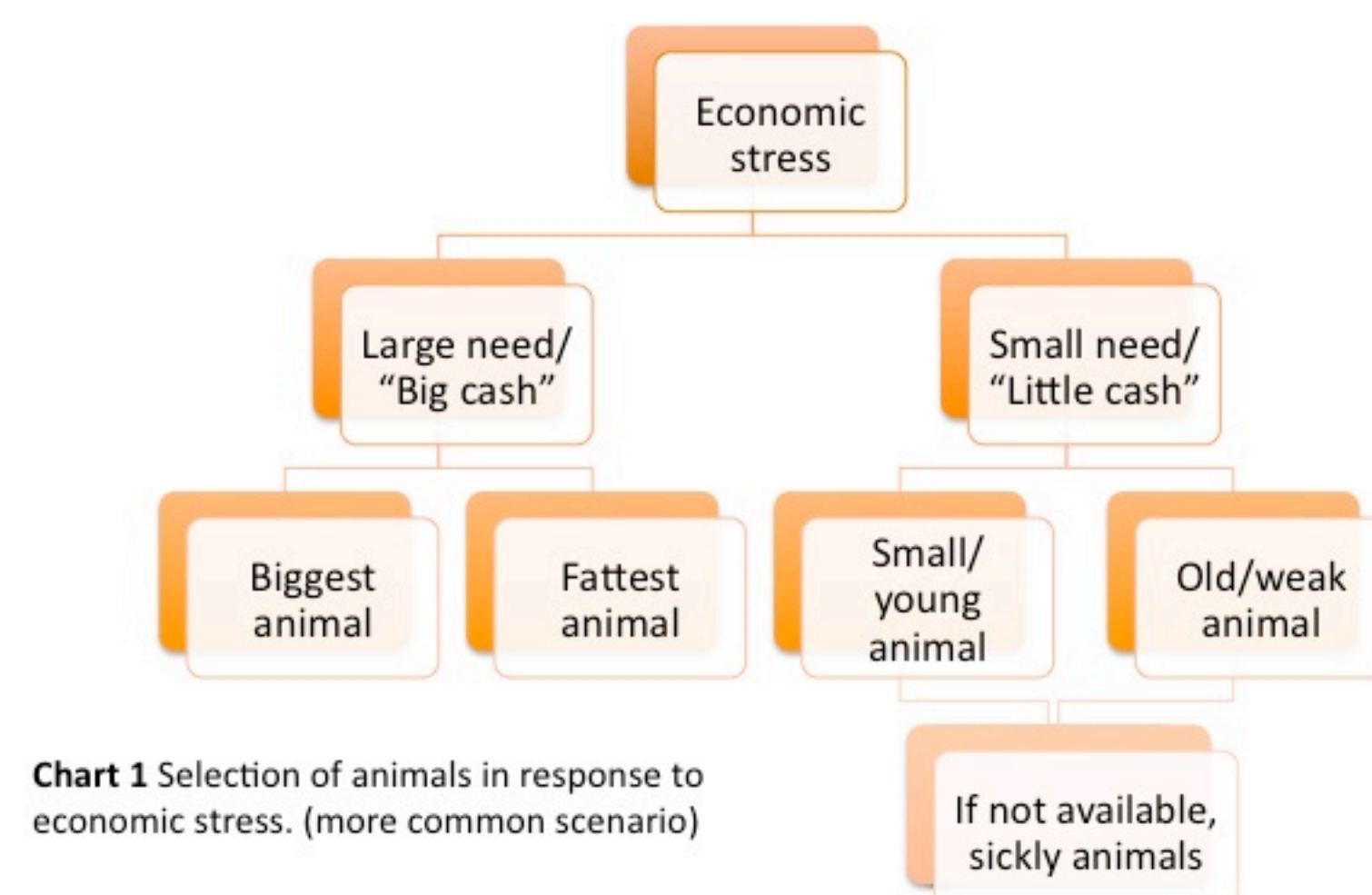


Chart 1 Selection of animals in response to economic stress. (more common scenario)

## Does disease affect reproduction?

Mobile and sedentary herders had similar reactions to animal disease.

Although we found a statistically significant difference in fertility rates between sedentary and mobile herds, the differences in the prevalence of Brucellosis was found to be non-significant.

There are other factors than disease management that influence herd fertility.



Fig. 11 DECML and CARPA team members collecting blood samples.



Fig. 12 Cluster of young calves grouping together against the flies.

## Conclusions

1. Herders keep sick animals within their herd for economic reasons.
2. The retention of animals with Brucellosis does not affect herd fertility, further supporting the herders' decisions to only sell chronically sick animals when definite economic loss is eminent.



Fig. 13 Young mobile herders pose for a photo-op.

## Study Population

Pastoralists rely on animals for subsistence. Cattle also play a key role in constructing their cultural system and defining themselves as a people.

The sample of 21 herds were selected from herds already participating in the project of the Disease Ecology and Computer Modeling Laboratory (DECML) at OSU.

11 sedentary and 10 mobile herds were selected to see if any significant variations exist between the two subgroups.



Fig. 5 Children belonging to the Arab Suwa ethnic group of mobile pastoralists. Mobile pastoralists are on the move with their herd in search of the best pastureland for their cattle.



Fig. 6 Sedentary herders have more permanent residences and often supplement their economic livelihoods with agriculture, such as growing millet.

## Effects of Brucellosis on Herd Fertility

We found an unexpected statistically significant, positive relationship between Brucellosis prevalence and herd fertility rates.

Exact nature of relationship needs further research.

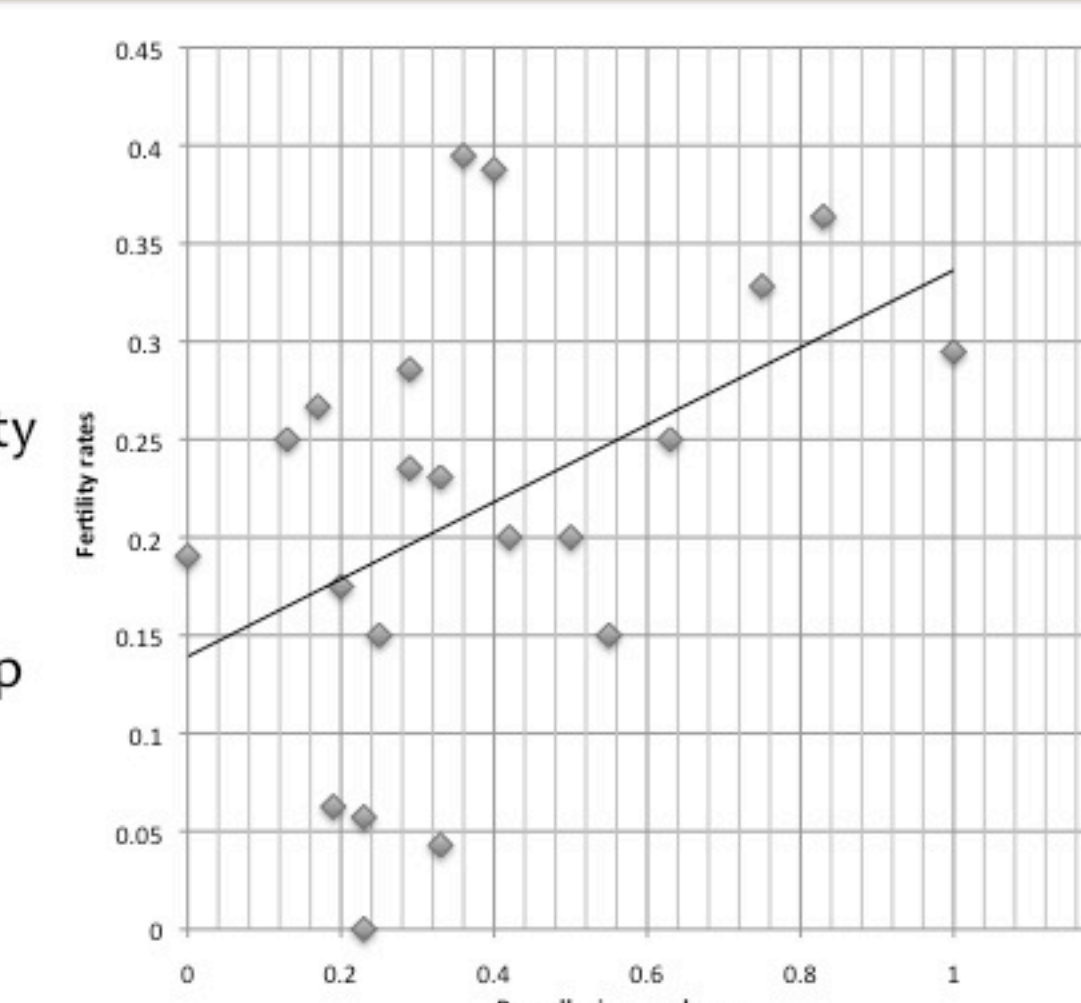


Chart 3 Brucellosis prevalence and herd fertility rates. (Pearson's  $r = 0.4385$ ;  $p$  value = 0.0468)

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