

## Data to Herd Productivity

#### Body Condition





#### Not just Back-Fat



#### **Measures of Body Condition**

- Body Mass (e.g., dressed carcass)
- Body Size (e.g., bone lengths)
- Reserves Protein (e.g., muscle)
- Reserves Fat (e.g., back / kidney / gut / marrow)





### Body Condition

linked to

Reproductive Success



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#### Affect Reproduction via

- Pregnancy rate + cow fall 'BC'
- Foetal mortality + cow fall 'BC'
- Calf birth wt + cow protein reserves
- Milk production + cow 'BC'
- Weaning strategy
- Cow age at 1<sup>st</sup> reproduction
- Delayed calving if hard winter



#### **Factors affecting Body Condition?**

- Climate / Weather
- Range / Forage
- Caribou age / sex / migration
- Caribou density
- HEALTH pathogens (Parasites / Disease)



## Health Monitoring (parasites + diseases)

## Data

## **Herd Productivity**

#### **Also Important**

#### Predators, Development, Disturbance, Competition other spp





#### Regulated human harvest

#### Predators Development Disturbance Competition other spp

#### **Greenland Caribou Migration**



## "SHORT" Migration







**Body Condition** March / April COWS Pregnant + Lactating + Calf-at-heel 12% 8% **Kangerlussuag-Sisimiut Akia-Maniitsoq** (AM) (KS)n = 34n = 34



## **Greenland** Caribou

## HEALTH 2 CARMA Herds



#### Known LACK of Disease NO...

Anthrax / Aujeszky's dis./ Echinococcosis / Heart Water / Leptospirosis / Q fever / Screw worm / Foot & Mouth / Rinderpest / Brucellosis / Vesicular stomatitis / Lumpy skin disease / Peste des petits rumninants / Sheep pox / Goat pox / Newcastle Disease / Swine fever / Bluetongue / Rift Valley fever / Swine vesicular disease/ Contagious bovine pleuropuneumonia / African horse sickness / African swine fever / Bird flu *Until recently* 

Paratuberculosis (Johne's Disease)





#### **Caribou Abundance**

AM KS Decline Stable



**Snapshot 1997 vs 2008-09 Body Condition Carcass Weight** AM KS Carcass Wt **Carcass** Wt NOT significant





## Øestrids

## Warble Fly Larvae

> 500

E Cost of supporting warble larvae burden modest...still

1) Supported the -ve relationship between Back fat &Warble #

## 2) High warble # could affect calf winter survival

Cuyler et al. 2012



#### **Dressed Carcass Weight**

2008 Akia-Maniitsoq All Cows > 3 yrs Carcass weight vs Warble number





#### **Dressed Carcass Weight**

2009 Kangerlussuaq-Sisimiut All Cows > 3 yrs Carcass weight vs Warble number





## Body Condition Reduced Cow's Foregone Carcass Wt per 100 Warble Larvae



## AM 1.4 kg

KS 1.1 kg



## Snapshot 1997 vs 2008-09 Mean + Max Warble number





Monitored variable often cannot be shown to affect fecundity / herd productivity

Recognize there are many factors affecting fecundity / herd productivity

> Even if not statistically significant still could be having an effect, most likely indirect



#### **GI Nematodes & Body Condition GI nematodes #'s** AM KS Kidney fat index Kidney fat index Protein mass Protein mass Back fat Carcass weight

Steele et al. 2012



Nematode Ostertagia gruehneri has negative effect on fecundity

# O. gruehneri



Steele et al. 2012



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## Snapshot 1997 vs 2008-09 Pregnancy rate





#### **Caribou Abundance**

AM KS Decline Stable



## Body Condition & HEALTH NOT a tidy picture

Seems there is an assumption that Body Condition & Health are tightly related to fecundity This is not necessarily true.

#### Statistics + Small Sample Size doesn't tell entire story





## Body Condition & HEALTH NOT necessarily the same thing



) 1 and 2 2m3 4 5 6 7 2m3 8 9 10 11 + 12 13 14 15 16 17 + 18 19 2 0 21 2 + 23 24 25 26 2



## For example?





JUNE COW She's in great Health but poor Body Condition



For example? Autumn Bull

Tænia cysts

High infestation (poor Health) Yet great Body Condition





#### **Body Condition Measures**

- Body Mass (e.g., dressed carcass)
- Body Size (e.g., bone lengths)
- Reserves Protein (e.g., muscle)
- Reserves Fat

   (e.g., back / kidney / gut / marrow)

#### Health Measures: pathogens

- Parasites (e.g., prevalence, intensity)
- Diseases



#### **Perhaps 2 Manuals Better?**

# Health (pathogens) Body condition



## Thoughts

- 1. Is pathogen effect on reproduction measurable?
- 2. Is pathogen effect too subtle to detect?
- 3. Body Condition & HEALTH (pathogens) are they dependent on each other?

4. Is Body Condition a major indicator of HEALTH independent of pathogens?



## How to integrate HEALTH (parasites + diseases) into herd monitoring?

## How to Link Health Data to Herd Productivity?

## Qujanaq

