

# Prevention : a key for success

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## Goals of a good preparation

- Sport performance
- Prevention of traumas/problems
- Better recovery after stamina
- Requires the best education of owner/trainer



## Keys to performance

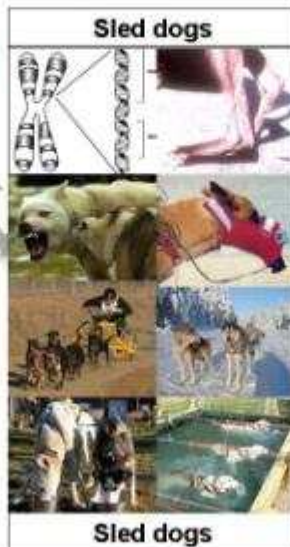
Optimisation of performance

Genetics

Behaviour

Training

Nutrition



Sled dogs

Sled dogs

Prevention/Treatment of specific problems

Traumatology

Stress related affections

Loss of performance

Fast rehabilitation



## PERFORMANCE BY PREVENTION

RESPECT OF HIGH MOTIVATION

TRAINING PROGRAMS

GENETIC SELECTION

LIFE IN KENNEL

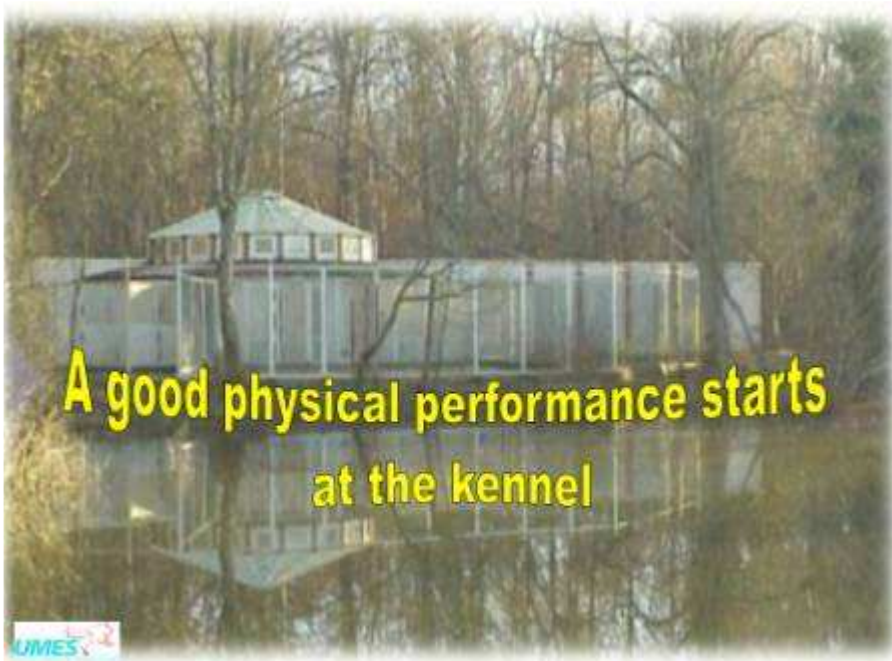
TRANSPORTATION

NUTRITION PLANS

BIOLOGICAL AND MEDICAL SURVEY

EQUIPMENTS





## Most sled dogs live in (large) kennels with breeding activity

### 1/ Kennel design and management

- Global sanitary conditions
- Quarantine kennel
- Reproduction kennel
- Dogs behaviour impact

UIMES

## Most sled dogs live in (large) kennels with breeding activity

### 2/ High rates of parasitism

- Intensive prophylactic programs
- Contaminated environments
- Education of owners / trainers

UIMES

## Most sled dogs live in (large) kennels with breeding activity

### 3/ Increased risks of infectious diseases

- Depressed immune response
- Life in collectivity
- Intensification / Enlargement of prophylactic programs
  - Leptospirosis every 6 month
  - Piroplamosis
  - Herpesvirosis
  - Coranovirosis

a shot in time  
vaccination  
recommandation

UIMES

# Most racing sled dogs travel a lot

## 4/ Numerous trips abroad

### ➔ Design of dog trucks



# Most racing sled dogs travel a lot

## 4/ Numerous trips abroad

### ➔ National sanitary regulations

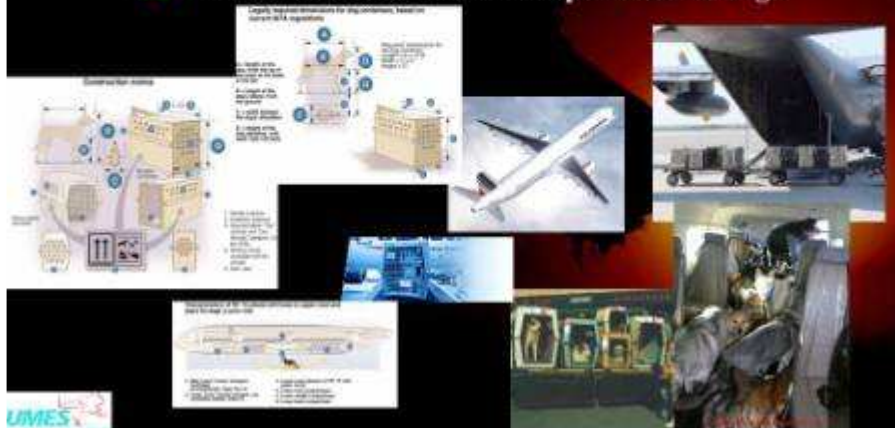
- . Local infectious diseases
- . Local parasitic diseases
- . Official documents
- . Return to kennel



# Most racing sled dogs travel a lot

## 4/ Numerous trips abroad

### ➔ Problems related to air transportation of dogs



## PERFORMANCE BY PREVENTION

**RESPECT OF HIGH MOTIVATION**

**TRAINING PROGRAMS**

**GENETIC SELECTION**

**LIFE IN KENNEL**

**TRANSPORTATION**

**NUTRITION PLANS**

**BIOLOGICAL AND MEDICAL SURVEY**

**EQUIPMENTS**

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## Basics of genetic selection

**Actually based on breeders experience**

- Motivation : behaviour
- Results : chrono, judge, discovery
- Stamina : speed, endurance, resistance
  - Subjectivity +++
  - Variability +++
  - Credibility ---

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## Repeatabilities and heritabilities for the most important traits of the finish spitz

[Vangen, 1989]

Trait	Repeatability	Heritability
Searching ability	0.31	0.07 ± 0.03
Finding Birds	0.14	0.11 ± 0.03
Marking birds	0.16	0.04 ± 0.02
Barking	0.28	0.02 ± 0.02
Holding birds	0.23	0.18 ± 0.04
Following birds	0.22	0.10 ± 0.03
Total impression	0.15	0.09 ± 0.03
<b>Total score</b>	<b>0.19</b>	<b>0.11 ± 0.03</b>

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## Heritabilities for different work qualities in the Malinois Belgian shepherd

[Degauchy, 1992]

Trait	Heritability
Follow up leash	0.03
Follow up no leash	0.09
Defense	0.00
No conductor	0.28
Ref. Food	0.00
Attack	0.54
Total impression	0.06
<b>Total score</b>	<b>0.17</b>

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### Performance index

$$Y_i = \mu + a_i + m_i + e_i$$

- $Y_i$  = one performance for one dog  $\leftarrow i$
- $\mu$  = mean of the standardized performances for individuals belonging to group of dogs  $\leftarrow i$
- $a_i$  = genetic value of dog  $\leftarrow i$
- $m_i$  = total identified environmental effects (quantified) influencing performance  $Y_i$
- $e_i$  = total of unidentified environmental effects influencing performance  $Y_i$  (other races, position, food...)

### Heritability studies

	Code	Heritability	Env. param. (days)	Heritability	Env. param. (days)	Heritability	Env. param. (days)
Swal	NW10	0.22	33.6	14.9	0.17	26.4	21.3
Solo	NW10	0.21	21.3	38.6	0.20	31.9	29.5
Reaper	NW10	0.22	42.7	19.2	0.10	14.0	37.3
Powbora	NW13	0.21	29.3	24.7	0.11	11.3	17.3
Alaska	NW11	0.21	32.8	13.3	0.14	13.6	18.5
Garda	NW10	0.21	30.7	17.9	0.10	14.0	30.3
Obolowens	NW10	0.21	32.8	18.8	0.10	11.0	18.0
Mordant	NW10	0.21	34.0	19.7	0.11	14.1	32.3
Total index	NW10	0.21	36.6	14.7	0.11	15.3	30.8

Genetic selection



### PERFORMANCE BY PREVENTION



### Respect a high degree of motivation

- 1 - Keep the dog happy
- 2 - Avoid overtraining



- 3 - As early as possible diagnosis of problems
- 4 - Stress consequences survey

## Causes of stress in the racing sled dog

[Holloway, 1998]

### Environmental Stress

- Overcrowding
- Poor sanitation
- Intestinal parasites
- Infectious diseases
- Poor nutrition
- Poor vaccinations
- Poor quarantine
- Poor husbandry
- Racing injuries
- Temperature
- Humidity
- Iatrogenic injuries

### Emotional stress

- Fighting
- Prerace excitement
- Transport
- Competition for food
- Need for exercise
- Sexual competition
- Overwork

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## Overtraining consequences

### Basedow-like (symp.)

- Early fatigue
- Hyperexcitation
- Sleep troubles
- Anorexia
- Body weight loss
- Tachycardia
- Slight hyperthermia
- Delayed recovery
- Exercise hyperpnea
- Tremors

### Addison like (parasymp.)

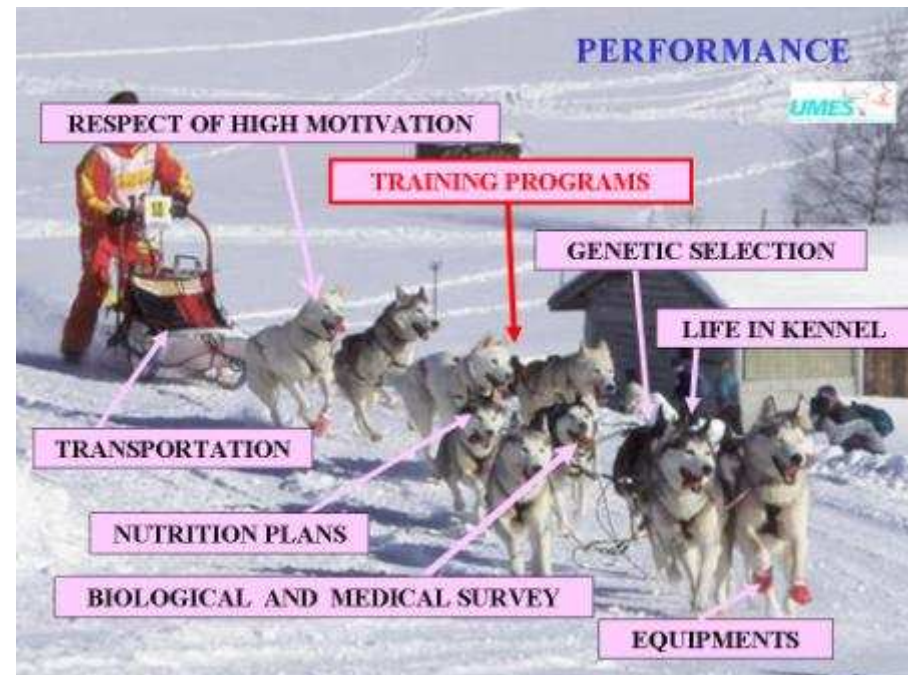
- Early fatigue
- Inhibition
- Sleep normaly
- Eats normaly
- Constant body weight
- Bradycardia
- Temperature normal
- Recovery normal
- Respiration normal
- Dyscoordination



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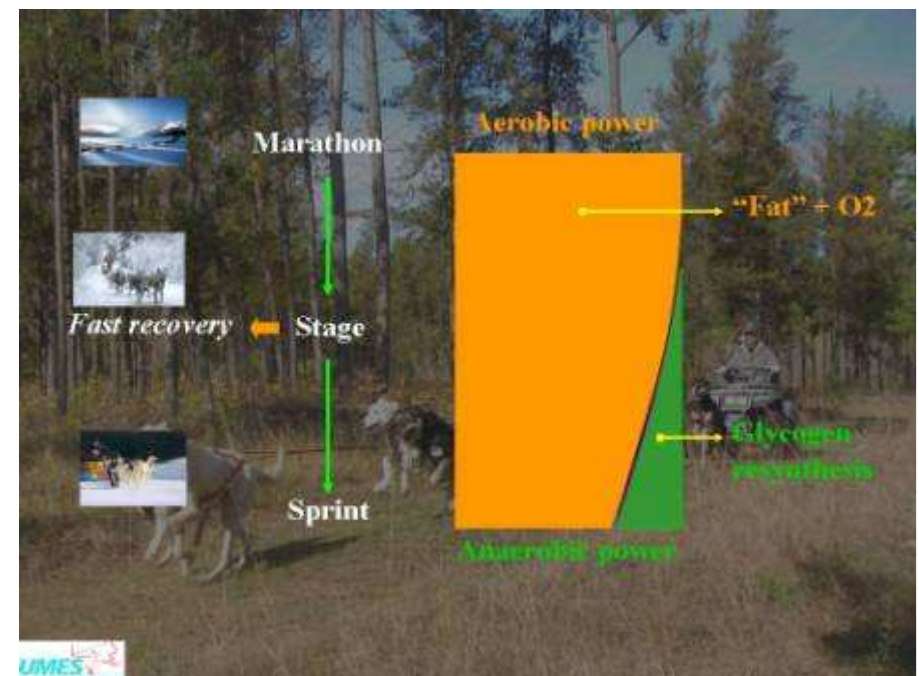


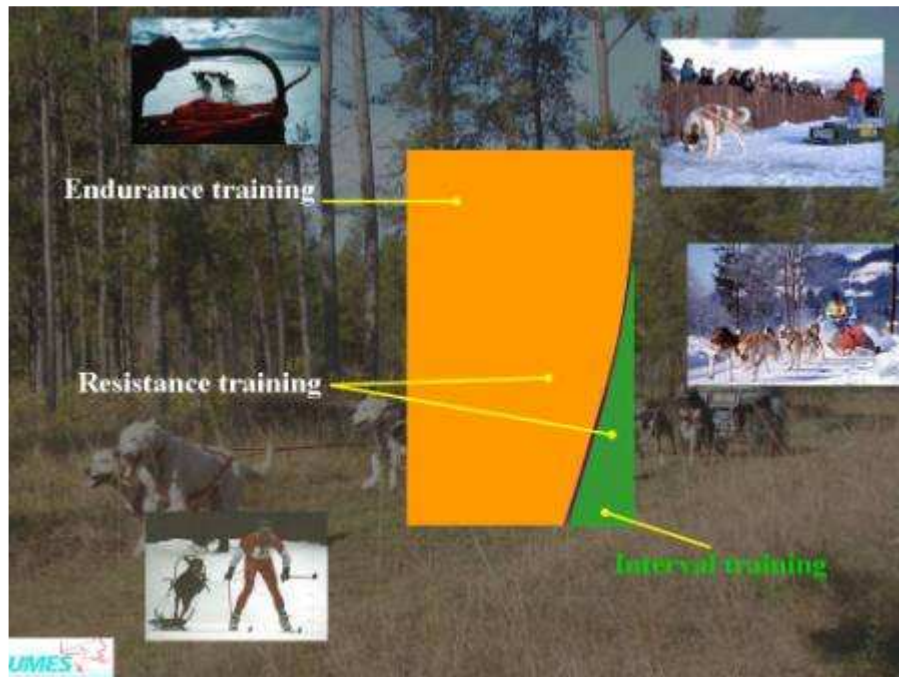
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Type of race	Example	p100 VO2 max
Ultra-marathon race	Iditarod, Finmark, Quest	30
Long distance race	Montana, Femund, Kobuk	50
Stage race	Wyoming, AttaBoy, Alpirod	70 → 110
Mid distance race	EC, WC	80 → 110
Sprint race	EC, WC	90 → 120

Additional images include maps of race routes and logos for 'Alpirod' and 'AttaBoy 300'.





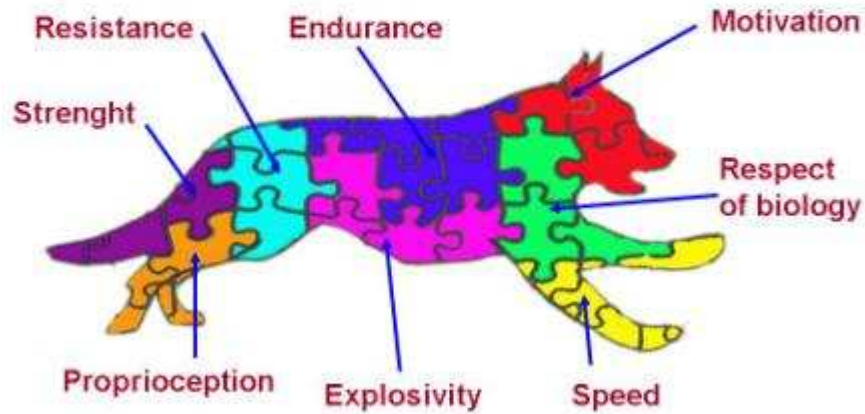
### Training programs

2/ Training load must permanent

Avoid cuts in the training program

- ↳ holidays (...)
- ↳ traumas (physiotherapy)
- ↳ sickness (early restart)

For each type of competition the training puzzle will be different



## Biological survey of racing sled dogs



- 1) Is the dog able to compete ?
- 2) Is « training » efficient ?
- 3) Can the performance be predicted ?

## Veterinary evaluation of the ability to compete

### 1/ Complete clinical examination

Cardiopulmonary system

Musculoskeletal examination

- observation of stance and gait
- assessment of the range of flexion and extension of the joints
- palpation of superficial musculature

Feet problems detection

Mucosas

### 2/ Official documents

Individual ID [microchips]

Sanitary documents

Dedicated rules

## Biological survey of racing sled dogs



- 1) Is the dog able to compete ?
- 2) Is « training » efficient ?
- 3) Can the performance be predicted ?

## Evaluation of training efficiency

### DYNAMIC TESTS

- ↳ Standardized field test
  - Same trial repeated each month
  - Comparison  $T_f$  vs  $T_0$
  - Body temperature, Lactates, Free fatty acids

- ↳ Evolution of  $VO_2$  max
  - Determination of  $VO_2$  max
  - Anaerobic threshold
    - Treatmill and static equipment
    - K4 Cosmed equipment

## Biological survey of racing dogs



- 1) Is the dog able to compete ?
- 2) Is « training » efficient ?
- 3) Can the performance be predicted ?

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## Prediction of performance



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## PERFORMANCE BY PREVENTION

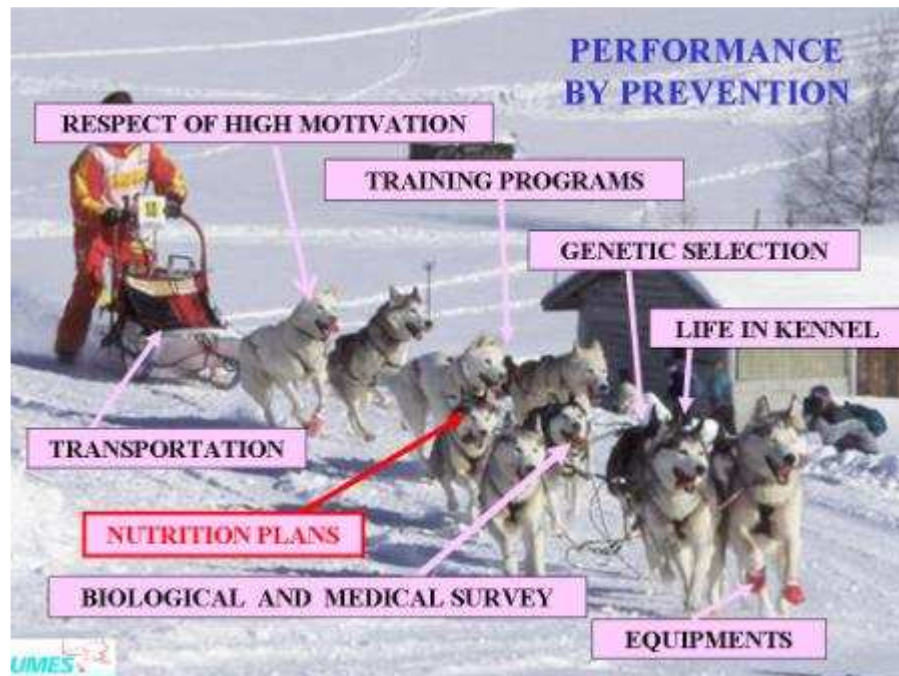


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## Equipments



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## The key points of racing sled dogs nutrition

1. Feed the correct amount of energy
2. Feed the correct quality of energy
3. Feed a diet coping with induced stress consequences
4. Feed a very highly concentrated diet
5. Feed a highly concentrated diet
6. Adapt food distribution to each dog
7. Always prevent dehydration
8. Learn how to read in the stalls
9. There is no « magic », no « guru », in nutrition
10. Genetic + training + nutrition at the same level

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## Specificities of working dogs

### 1 - Physiology

- Increased Energy Expenditure
- Aero and/or Anaerobic stamina
  - ↳ Quality of nutritional energy
- Impact of nutrition on VO2 max
- High level of cellular oxidative stress
- Extracellular dehydration

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# Specificities of working dogs

## 2 – Type of work

- **Hard physical stamina**

- ↳ speed
- ↳ resistance
- ↳ endurance
- ↳ jump

- **Stressing nose work**



Paris



New York



# Specificities of working dogs

## 3 – Hostile environments



Cold (Alaska)



Warm (Argentina)



Altitude (Chile)

# Specificities of search and rescue dogs

## 4 – Stress related pathology

- ↳ Stress Diarrhea Dehydration Syndrom
- ↳ Rhabdomyolisis
- ↳ Water diabetes
- ↳ Traumatology

# Research conducted with U.M.E.S. by Royal Canin

- ↑ ↑ **Proteins in the diet [Prot/Cal Ratio > 30]**
  - ↳ Endocrinology of stress
  - ↳ Prevention of « Sport Anemia »
- ↑ ↑ **Energy transfers [L. carnitine, BCAA]**
  - ↳ ↑ VO<sub>2</sub> max
  - ↳ ↓ lactate production
- ↑ ↑ **Muscle oxygenation [Chaperon, Oxidic acids]**
  - ↳ ↑ Antioxidation
- ↑ ↑ **Oxidative stress [Vitamins B, C, polyphenols, SOD...]**
  - ↳ Prevention of related pathologies
  - ↳ ↑ length of the dog's carrier





TRAINING	GOALS	NUTRITION
VO <sub>2</sub> max ↑↑	ENDURANCE	Fueling : fat...
Lactates Tolerance	RESISTANCE	LDH : Zn ; Vitamins B...
Muscle Power	STRENGTH	Solid bones and tendons : Prot, Ca, P...
Anaerobic Lactic Power	SPEED	Fueling : glycogen, Vit B...
Movement balance	PROPRIOCEPTION	Quality of joints : gags, omega3, oe...
Work as a game	MOTIVATION	Neuromediators : amino-acids
Red cell count ↑↑	OXYGEN TRANSPORT	Sports anemia: proteins
Oxidative stress ↓↓	STRESS	Antioxidant nutrients

## The key points of racing sled dogs nutrition

1. Feed the correct amount of energy

Rest 1100 kcal

4000 kcal

Iditarod 11000 kcal

Period	Energy Requirements
Maintenance	1000-1200
Training (5 to 8 km/day)	1300-1400
Training (<10 to 20 km/day)	1700-1800
Training (20 km/day)	2000-2400
Speed race	1400-1600
Long distance race	2000-3000
Iditarod	7500-8000

Dryfood

[#4800 kcal/kg]

100g = 480 kcal

100g = 480 kcal

**Dryfood**      **Work Complément**



**"30/30"**

Casein Eq	30 p100
Saturated fat	30 p100
MSC fat	25 p100
Omega 6/3 fat	4/1p100
Yeast	4p100
MVC	6p100

**"45/45"**



## The key points of racing sled dogs nutrition

**2. Feed the correct quality of energy**



- ↳ Long saturated fatty acids
- ↳ Short and Medium chains fatty acids
- ↳ Omega 3 fatty acids
- ↳ Glycogen resynthesis



## The key points of racing sled dogs nutrition

**3. Feed a diet coping with induced stress consequences**

↳ Related problems

- Stress Diarrhea Dehydration Syndr
- Rhabdomyolisis
- Sudden Death Syndrom
- ↓ Cognitive functions
- ↓↓ Performance




## The key points of racing sled dogs nutrition

**3. Feed a diet coping with induced stress consequences**

↳ Nutritional approach of stress prevention

- Protein level > 30p100 DM/En [PCR > 65 g / Megac
- Omega 3 fatty acids
- Antioxydants
  - ↳ vitamin E/C
  - ↳ polyphenols
  - ↳ bioflavonoids
  - ↳ SOD
  - ↳
- Clays, FOS, MOS, psyllium




## The key points of racing sled dogs nutrition



### 4. Feed a highly digestible / concentrated diet

- Top quality dry food up to 4000 - 5000 kcal / day
- then
- Top quality energy / protein complement



## The key points of racing sled dogs nutrition

### 5. Food distribution

- Individual gastric response to stress [dry or watery]
- Divide meals as much as possible
- As early as possible after racing



## The key points of racing sled dogs nutrition

### 5. Food distribution

#### ↳ Snacks

- Recovery helpers : 30 minutes after stamina
  - ↳ glycogene recharge
  - ↳ energy enhancers



- Immediate energy sources
  - ↳ short-Medium Chain fatty acids
  - ↳ isotonic electrolytes



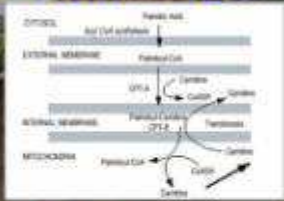
## The key points of racing sled dogs nutrition

### 6. Food distribution

- Dogs education in kennel
- Use or abuse of electrolytes
- Fat oxidation is metabolic water
- Long distance : requirements ↑ x 2 to 3



# The key points of racing sled dogs nutrition



- L carnitin
- Vitamin E
- Vitamin C
- Vitamins B
- GAGS
- Lutein,  $\beta$ carotene, polyphenols
- Probiotics

## 7. Ergogenic aids

# PERFORMANCE IS NO MAGIC



THANK YOU !  
QUESTIONS ?

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