

# Beyond obesity... a disease can hide another one

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# CLINICAL CASE

Patient assessment:      DENTELLE

Species: Canine

Breed: Cocker spaniel

Sex: spayed female

Age: 4 years

Current Body Weight: 15,3 kg

Ideal Body Weight: 11kg

Diet: Cocker 25 Royal Canin

String beans

Table scraps

Reported: Lethargy and loss of interest for any activity

“... the dog is very hungry...”



The owner asked for a homemade diet.

# CLINICAL HISTORY

1° Visit (15/09/2011)

Body weight: 16,3 kg

First Consultation in Nutrition (owner choice)

Good quality of hair and skin

Body Weight: 15,3 kg

\*BCS: 9/9

\*MCS: ok, no muscle wasting

Ideal Body Weight: 11kg

% overweight = 39%

Diet

75g Cocker Royal Canin  
150-200g String beans  
Table scraps



## Nutrient

Moisture (%)	8
Protein (%)	25
Ether extract (%)	14
Fiber (%)	1,3
Energy density (kcal/g) (kJ/g)	4,144 17,338
Calcium (%)	0,75
Phosphorus (%)	0,7

# CLINICAL CASE

## Dietary nutrient requirements:

### 1. Energy requirement

$$130 \times (BW_i)^{0,75} \times k_1 \times k_2 \times k_3 \times k_4 = 130 \times (11)^{0,75} = 785 \text{ kcal [3284kJ]}$$

$$785 \times 0,9 \times 0,8 = 565 \text{ kcal/day}$$

$$[2364\text{kJ/day}]$$

$K_1$  = Breed

“The dog breeds with increased risk of obesity are the Labrador retriever, Boxer, Cairn terrier, Scottish terrier, Shetland sheepdog, Basset hound, Cavalier King Charles spaniel, Cocker spaniel, Dachshund (especially long-haired), Beagle, and some giant breed dogs...” [Zoran, 2010]

$K_3$  = Physiological status

“Another clear risk factor for obesity is neutering; the incidence of obesity is higher in neutered dogs of both sexes. This problem is believed to be due to hormonal changes associated with neutering and the reduced metabolic rate that occurs with the loss of sex hormones...” [Zoran, 2010]

$K_2$  = Activity

“... and a sedentary lifestyle that results in a lack of significant exercise.” [Zoran, 2010]

Diet energy = 311 kcal/ 1301 kJ [petfood]  
66kcal/ 278kJ [string beans]  
???? [table scraps]

# CLINICAL CASE

## Dietary nutrient requirements:

1. Energy requirement
2. Protein requirement
3. Lipid allowance
4. Fiber requirement
5. Carbohydrate allowance
6. Mineral and vitamin requirement



# CLINICAL CASE

## Dietary nutrient requirements:

### 1. Energy allowance

$$130 \times (BW_i)^{0,75} \times k_1 \times k_2 \times k_3 \times k_4 = 130 \times (11)^{0,75} \times 0,9 \times 0,8 =$$
$$= 565 \text{ kcal/day} \quad [2364 \text{ kJ/day}]$$

$K_4$  = Diseases

“Other important risk factors for obesity in dogs are endocrine disorders such as hypothyroidism and hyperadrenocorticism, medications that result in hyperphagia...” [Zoran, 2010]

$$\text{Energy allowance} = 130 \times (11)^{0,75} \times 0,5 = 393 \text{ kcal/day} \quad [1644 \text{ kJ/day}]$$

[Diez et al., 2002; Diez and Nguyen, 2006]

# CLINICAL CASE

## Dietary nutrient requirements:

### 2. Protein requirement

175-180 g lean meat

### 3. Lipid allowance

2 g rapeseed oil

### 4. Fiber requirement

150 g zucchini (ME = 0,13kcal/g)

### 5. Carbohydrate allowance

30-35 g raw rice (~ 100-105g cooked)

### 6. Mineral and vitamin requirement

1,25 g calcium

.... In case of no  
weight loss,  
consultation in  
endocrinology unit  
...

# CLINICAL CASE

	g	Protein (g)	Fat (g)	A CHO* (g)	TDF** (g)	Ca (g)	P (g)	ME (kcal/kJ)
Lean meat	175	35	8,7	-	-	0,01	0,35	227/950
Rapeseed oil	2	-	2	-	-	-	-	18/75,3
Zucchini, cooked	150	3	0,43	3,39	1,62	0,03	0,04	30/125,5
Rice, cooked@	105	2,6	0,1	27,3	0,1	0,01	0,08	121/504,7
MV Suppl Ca/P=2	8					1,2	0,6	
						1,25	1,07	396/1655,5

@ 105g cooked rice = 35 g raw rice

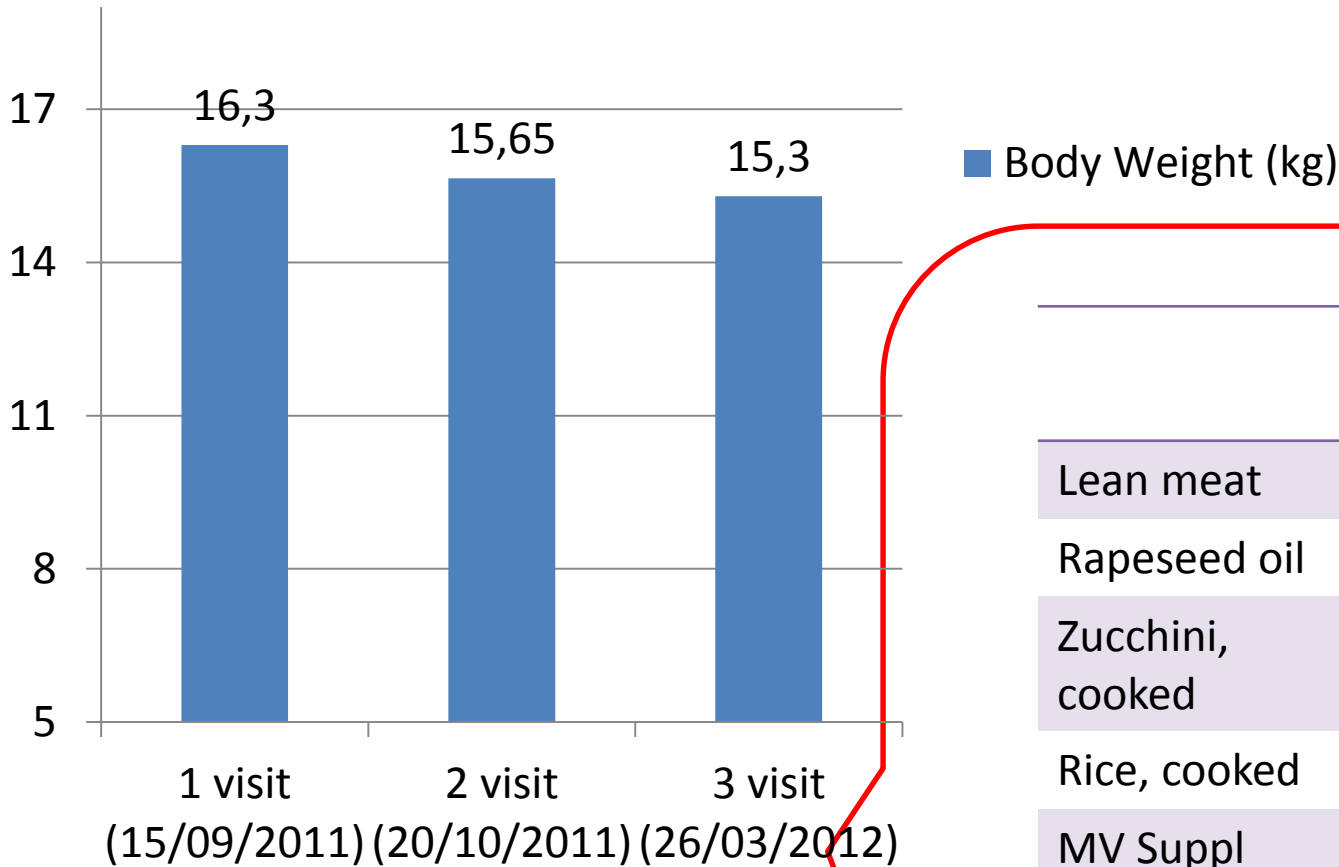
\*A CHO = Available carbohydrates

\*\*TDF = Total Dietary Fiber

(MV Suppl = 8 g PetPhos growth Ca/P = 2; 15% Ca)

(Souci, Fachmann , Heinrich; 2008)

# BODY WEIGHT TRENDS

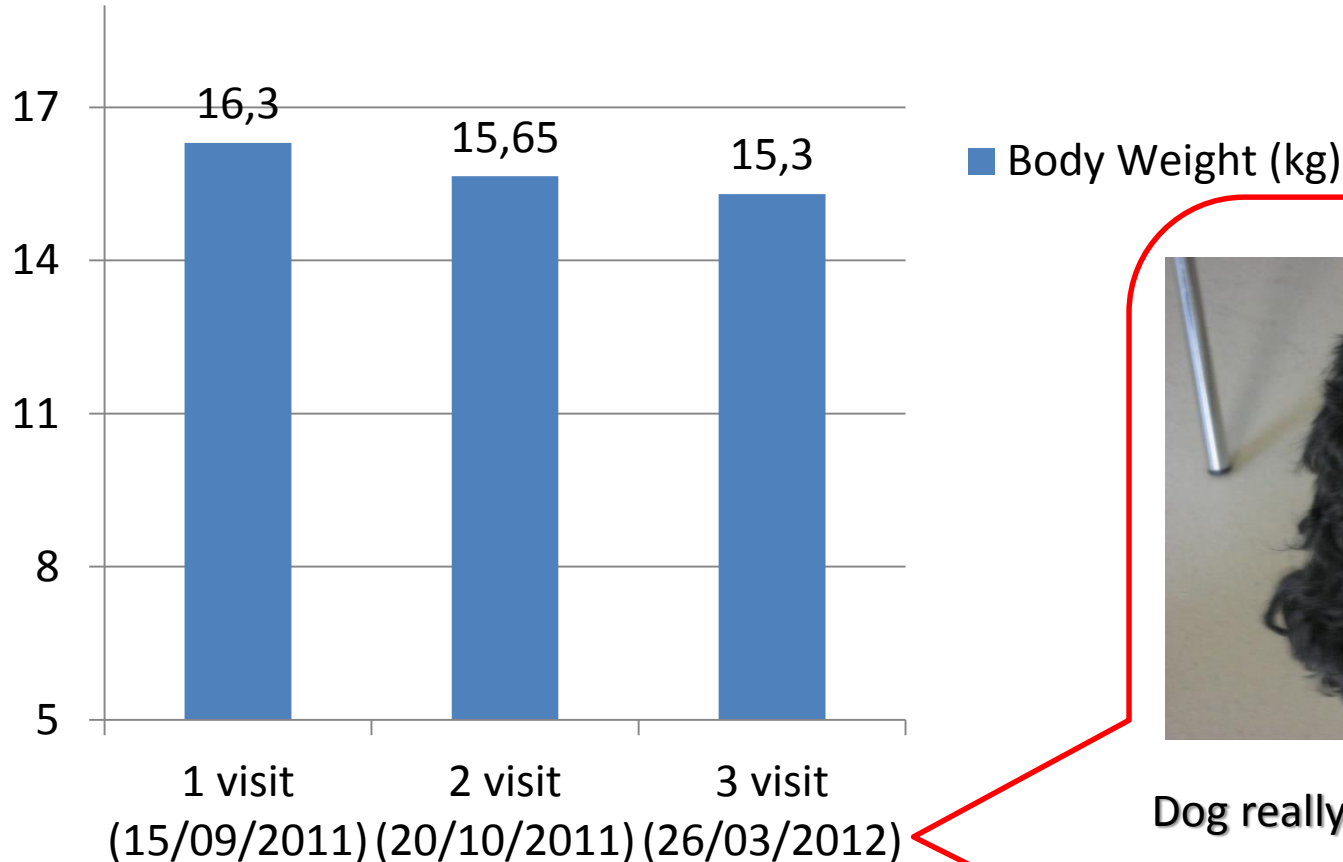


Stop agility: the dog refused all exercise, seems very tired

	g	ME (kcal/kJ)
Lean meat	175	227/950
Rapeseed oil	2	18/75,3
Zucchini, cooked	200	40/167,3
Rice, cooked	90	103/430,5
MV Suppl	8	
		388/1623

Update of the diet

# BODY WEIGHT TRENDS

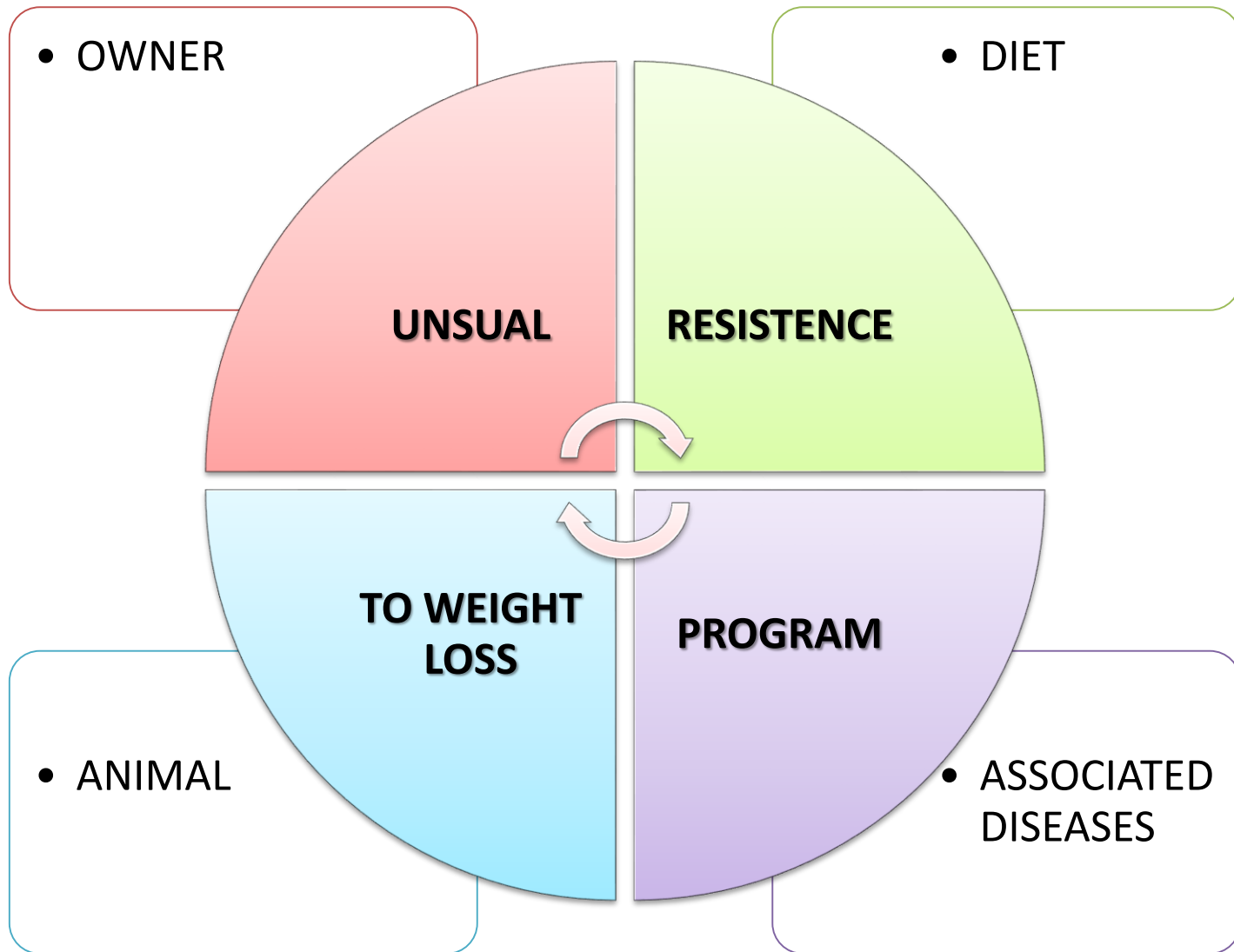


Dog really lethargic!!!

Fur problem

Unusual resistance to the weight loss program

## FURTHER INVESTIGATIONS



	Values	Unit	Reference values
Red blood cells	5,52	Milions	5,5-8,5
Hemoglobin	<b>12,7</b>	g/100	13,2-19
Hematocrit	<b>35,8</b>	%	40-55
Reticulocytes	73200	/mm <sup>3</sup>	0-60000
Leucocytes	8650	/mm <sup>3</sup>	6000-12000
Lymphocytes	3220	/mm <sup>3</sup>	1000-3600
Monocytes	240	/mm <sup>3</sup>	40-500
ALT	111	UI/l	15-125
Alkaline phosphatase	<b>246</b>	UI/l	50-110
Albumins	35	g/l	32-47
Total proteins	80	g/l	
Glycaemia	1,09	g/l	0,8-1,1
Urea	0,45	g/l	0,21-0,53
Creatinine	12	mg/l	0-15
Total cholesterol	<b>9,13</b>	g/l	1-3
TSH canine	<b>3,52</b>	ng/ml	0-0,5
T4 (total)	<b>&lt;6,4</b>	nmol/l	25-50

## CONSULTATION IN ENDOCRINOLOGY UNIT

# *CANINE HYPOTHYROIDISM*

- Decrease production of thyroxine (T4) and triiodothyronine (T3) by the thyroid gland.
- Because thyroid hormones influence the function of many organs, clinical signs of hypothyroidism may be nonspecific.
- Common clinical signs attributable to decrease of metabolic rate include lethargy, mental dullness, weight gain, unwillingness to exercise.
- A mild non-regenerative anemia occurs in 30% of hypothyroid dogs. Fasting hypercholesterolemia occurs in 75% of hypothyroid dogs, whereas hypertriglyceridemia occurs in up to 88%. Less common and less specific abnormalities include mild increases in alkaline phosphatase, alanine aminotransferase, and creatine kinase.
- Obesity occurs in approximately 40% of hypothyroid dogs, but most obese dogs suffer from overnutrition rather than hypothyroidism.

(Ettinger and Feldman, 2010)

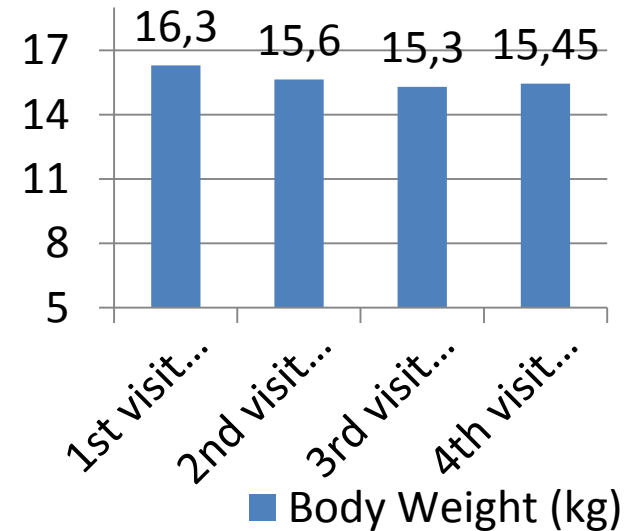
# ENDOCRINOLOGY UNIT

## CONFIRMATION OF HYPOTHYROIDISM

Current Body Weight: 15,45 kg

Therapy: Leventa 20 $\mu$ g/kg [0,3 ml; 1mg/ml]

Once in a day, in the morning



LEVENTA (Intervet) - levothyroxine sodium:

1 mg/ml solution

Dosage : attack dose 20  $\mu$ g/kg

Monitoring: every four weeks until an euthyroid state has been achieved

# FOLLOW UP CLINICAL CASE

1<sup>st</sup> Control

Adjustment of therapy: reduction of 20% dosage

Leventa 15µg/kg [0,2 ml; 1mg/ml] Once in a day

Current Body Weight : 14,1 kg      Previous Body Weight : 15,45 kg      Ideal Body Weight: 11kg

BCS: 8/9

MCS: ok, no muscle wasting

Loss of weight = 1,35 kg in 3 weeks

% loss per week = 2,4 %

Fur is growing!!!



*Balancing of the diet: increasing amount of rapeseed oil (4 g)*

# FOLLOW UP CLINICAL CASE

2<sup>nd</sup> Control

Leventa 15µg/kg [0,2 ml; 1mg/ml] Once in a day

Current Body Weight : 13,8 kg      Previous Body Weight : 14,1 kg      Ideal Body Weight: 11kg

BCS: 7/9

MCS: ok, no muscle wasting

Loss of weight = 0,3 kg in 4 weeks

% loss per week = 0,54 %

FOOD	AMOUNT (g)	ME (kcal)	ME (kJ)
Lean meat	175 g	227 kcal	950 kJ
↓ Rapeseed oil	2 g (1/2 coffee spoon)	18 kcal	75,3 kJ
↑ Zucchini, cooked	300 g	60 kcal	251 kJ
↓ Rice , cooked	75g	86,25 kcal	360,5 kJ
MV Suppl*	8 g	-	-
		391 kcal	1636,8 kJ

\* MV Suppl: PetPhos Growth Ca/P = 2

***THANK YOU FOR THE ATTENTION***



# CLINICAL CASE - REFERENCES

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