

ESVCN

European Society of
Veterinary & Comparative
Nutrition



Effect of homemade diets on SDMA: 3 cases

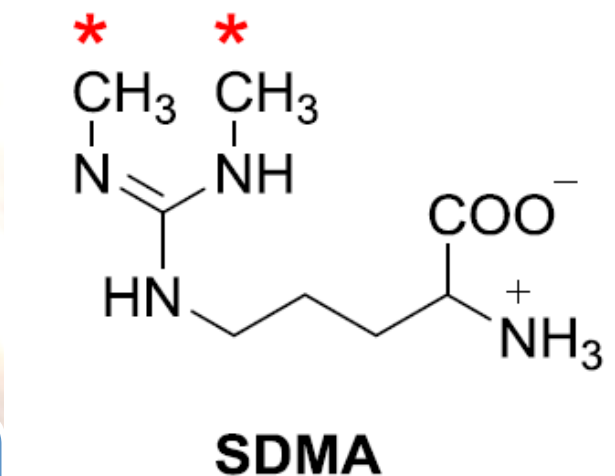
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Symmetric dimethylarginine (SDMA)

SDMA as a more specific, sensitive, and accurate marker of renal function compared with serum creatinine. (Yerramilli et al, 2016)

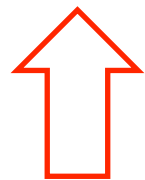
The renal excretion of SDMA to be greater than or equal to 90%. (Schwedhelm et al, 2011)

SDMA is derive of Arginine,
Post-translational
modification of protein
arginine groups occurs in the
mitochondria . (Yerramilli et
al, 2016)



SDMA

Nutritional Keys



SDMA

-
- A large blue bracket on the left side of the list, grouping all five items.
1. Protein restriction at least 8% DM
 2. Protein Quality
 3. Phosphorus restriction < 0,5% DM
 4. High caloric density
 5. Omega-3 > 0.4 % DM

Protein Quality

Protein quality refers to the efficiency by which amino acids from food are converted into tissue. (Brown, 1989).

Proteins that provide optimal proportions of all essential amino acids are referred as high quality proteins.

Quality Proteins

Animal
Protein

Plant
Protein

1. Who?

- Oliver
- 9 years
- English Setter
- Male
- BCS 5/9
- MCS normal
- Body Weight 28 kg



Medical History

- Case referred to Veterinary Teaching Hospital, University of Turin

Where

Why

- Annual check-up

- July 2016

When

What

- Exercise intolerance
- Polyuria
- High SDMA and Creatinine

Biochemical Analysis

	Parameters	Range
Urea	26	9-29 mg/dL
Creatinine	1.5	< 1.4 mg/dL
SDMA	17	< 14 ug/dL

Previous diet

1340 Kcal/day

	% DM
Crude Protein	42
Ether Extract	13
Crude Fiber	4
Ash	9
Calcium	0.9
Phosphorus	0.9
Omega 3 fatty acids	0.017
Vitamin E	0.015

Protein on diet

Protein percentage on food (DM):

- Cod 91% Protein (N x 6.25)
- Quinoa 17% Protein (N x 6.25)

Food percentage on diet (DM):

- 65% Cod
- 20% Quinoa
- 15% Others

Protein percentage on diet (42% DM):

- 52% Cod
- 14% Quinoa.
- 34% Others

Calculation Kilocalories

$MW \times 108 = 1320 \text{ Kcal/day}$

Appropriate Kilocalories

Nutritional Values of NEW Dietary Management

	% DM
Crude Protein	20
Ether Extract	23
Crude Fiber	1
Ash	3.3
Calcium	0.5
Phosphorus	0.4
Omega 3 fatty acids	0.4
Vitamin E	0.04

Protein on diet

Protein percentage on food (DM):

- Rabbit 70% Protein ($N \times 6.25$)

Food percentage on diet (DM):

- 46% Rabbit
- 54% Others

We give less protein
BUT with higher
protein quality

Protein percentual on diet (20% DM):

- 95% Rabbit
- 5% Others

Follow-up November 2016

A long-haired dog, possibly a Weimaraner, is standing on a gravel path in a grassy field. The dog is wearing a collar and a leash. The background shows a fence and a cloudy sky.

- Dog was more active
- Body weight maintained
- BCS 5/9
- MCS normal
- Value of SDMA normal
- Feeding unchanged

Follow-up November 2016

Parameters		Range	Previous	
Urea	13	9-29 mg/dL	↓	26
Creatinine	1.0	< 1.4 mg/dL	↓	1.5
SDMA	14	< 14 ug/dL	↓	17

2. Who?

- Jordan
- 2 years
- Jack Russel Terrier
- Male
- BCS 4.5/9
- MCS mild loss
- Body Weight 5.2 Kg
- Ideal weight 5.7 Kg

Medical History

- Case referred to Veterinary Teaching Hospital, University of Turin

Where

Why

- Annual check-up

- June 2016

When

What

- Lack of appetite
- Reduced definition renal cortical-medullary junction
- High SDMA, Creatinine, Urea

Biochemical Analysis

	Parametes		Range
Urea	↑	35	9-29 mg/dL
Creatinine		1.4	< 1.4 mg/dL
SDMA	↑	19	< 14 ug/dL

Previous diet

320 Kcal/day

	% DM
Crude Protein	25
Ether Extract	12
Crude Fiber	1
Ash	2
Calcium	0.07
Phosphorus	0.26
Omega 3 fatty acids	0.16
Vitamin E	0.002

Protein on diet

Protein percentage on food (DM):

- Chicken 65% Protein ($N \times 6.25$)
- Polished rice 7.3% Protein ($N \times 6.25$)

Food percentage on diet (DM):

- 42% Chicken
- 29% Polished rice
- 29% Others

Protein percentual on diet (25% DM):

- 77% Chicken
- 20% Polished rice
- 3% Others

Calculation Kcal

$MW \times 108 = 400 \text{ Kcal/day}$

Before ingest 320 Kcal/day

$400 - 320 = 80 \text{ Kcal/day}$
20% kcal fewer

Nutritional Values of NEW Dietary Management

	% DM
Crude Protein	19
Ether Extract	28
Crude Fiber	1.6
Ash	3.4
Calcium	0.5
Phosphorus	0.44
Omega 3 fatty acids	0.25
Vitamin E	0.04

Protein on diet

Protein percentage on food (DM):

- Chicken 67% Protein (N x 6.25)
- Egg yolk 34% Protein (N x 6.25)

Food percentage on total diet:

- 22% Chicken
- 6.5% Egg yolk
- 71% Others

We give less protein
BUT with higher
protein quality

Protein percentual on diet (15% DM):

- 76% Chicken
- 15% Egg yolk
- 8% Others

Follow-up August 2016

- Renal echo unchanged
- Increased body weight (5.7 Kg)
- BCS 5/9
- MCS ideal
- SDMA and Urea decreased
- Creatinine wnl
- Feeding unchanged

Follow-up August 2016

Parameters		Range			
Urea	33	9-29 mg/dL	↓	35	
Creatinine	1.3	< 1.4 mg/dL	↓	1.4	
SDMA	18	< 14 ug/dL	↓	19	

Follow-up August 2017

- Renal echo stable
- Body weight, BCS, MCS maintained
- SDMA and Urea decreased **BUT**
Crea worsened...
- Feeding unchanged

Follow-up August 2017

Parameters		Range			
Urea	32	9-29 mg/dL	↓	33	
Creatinine	1.4	< 1.4 mg/dL	↑	1.3	
SDMA	17	< 14 ug/dL	↓	18	

Who?

- Fujiko
- 2 years
- Czechoslovakian Wolf Dog
- Female
- BCS 4/9
- MCS mild loss
- Body Weight 23 kg
- Ideal Weight 26 kg

Medical History



- Case referred to Veterinary Teaching Hospital, University of Turin

Where

Why

- Annual check-up

- July 2016

When

What

- Chronic Diarrhea (weekly)
- High SDMA and Urea

Biochemical Analysis

	Parametes		Range
Urea	↑	30	9-29 mg/dL
Creatinine		1.2	< 1.4 mg/dL
SDMA	↑	17	< 14 ug/dL

Previous diet

1430 Kcal/day

	% DM
Crude Protein	41
Ether Extract	9
Crude Fiber	2.6
Ash	0.5
Calcium	0.002
Phosphorus	0.42
Omega 3 fatty acids	0.1
Vitamin E	0.0013

Protein on diet

Protein percentage on food (DM):

- Whole chicken without skin 80% Protein ($N \times 6.25$)

Food percentage on diet (DM):

- 60% Whole chicken without skin
- 40% Others

Protein percentual on diet (41% DM):

- 96% Whole chicken without skin
- 4% Others

Calculation Kcal

$MW \times 108 = 1240 \text{ Kcal/day}$

Before ingest 1430 Kcal/day

$1430 - 1240 = 190 \text{ Kcal/day}$
15% kcal high

Nutritional Values of NEW Dietary Management

	% DM
Crude Protein	33
Ether Extract	23
Crude Fiber	2.7
Ash	6
Calcium	0.5
Phosphorus	0.5
Omega 3 fatty acids	0.12
Vitamin E	0.014

Protein on diet

Protein percentage on food (DM):

- Beef meat 75% Protein ($N \times 6.25$)

Food percentage on diet (DM):

- 38% Beef meat
- 62% Others

We give less protein
BUT with higher
protein quality




Protein percentual on diet (33% DM):

- 93% Beef meat
- 7% Others

Follow-up October 2016

- Body weight increased (25 Kg)
- BCS 4.5/9 MCS normal
- Diarrhea improved
- SDMA decreased
- Urea wnl
- Feeding unchanged

Follow-up October 2016

Parameters		Range	Previous
Urea	20	9-29 mg/dL	 30
Creatinine	1.2	< 1.4 mg/dL	 1.2
SDMA	15	< 14 ug/dL	 17

Analysis Results

- Improved healthy status
- Improved BW, BCS and MCS
- SDMA decreased to normal level
- Improved clinical symptoms



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Thanks for your attention

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