



## Animal studies on ProDen PlaqueOff®

SDC Swedencare AB 2014-05-23



## Animal studies on ProDen PlaqueOff<sup>®</sup>

### Initial studies - open pilot studies

- A Clinical Study to Determine the Effectiveness of Maritime Algae on Canine & Feline Oral Health (Cypress study).
- Kyoritsu Seiyaku Corporation, Tokyo (Japan study).
- PlaqueOff Animal study, dogs and cats 2007-2008 (Varberg study).

### Controlled study

- Effects of *Ascophyllum nodosum* contained in supplement on oral health index in dogs and cats. J. Gawor, K. Jodkowska and M. Jank. PAZDZIERNIK 10/2013 (Poland study).

### Parallel controlled study

- Evaluation for the Effectiveness of ProDen PlaqueOff on the Reduction of Plaque, Calculus, Gingivitis and Oral Malodor in Adult Beagles (Summit Ridge Farms study)

### Randomised double blind placebo controlled study

- Influence of PlaqueOff<sup>®</sup> Animal on plaque and calculus formation in dogs. L. Wikhamre, E. Ellström, G. Bratthall, Periodontology, Malmö University/Veterinary clinic Helsingborg, Sweden, 2010 (Helsingborg study)

## A Clinical Study to Determine the Effectiveness of Maritime Algae on Canine & Feline Oral Health (Cypress study)

**Aim:** To determine the effectiveness of the alga on malodor, calculus tenacity and plaque level.

**Type of study:** Single-blind pilot intervention study.

**Endpoints:** Plaque, calculus tenacity, malodor.

**Responsible:** D. Pedersen, M Saverino.

**Place:** Cypress collage, Philadelphia, US.

**Time:** 2005.

**Participants:** 8 dogs + 2 cats with their owners .

**Duration:** 2 month.

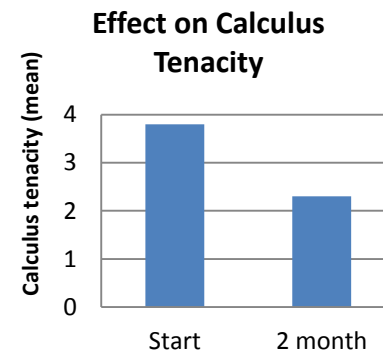
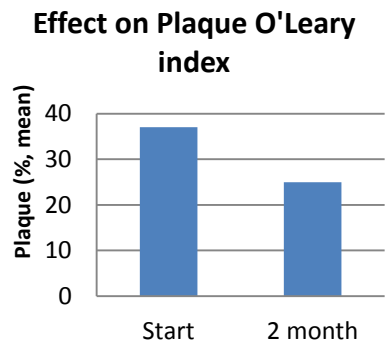
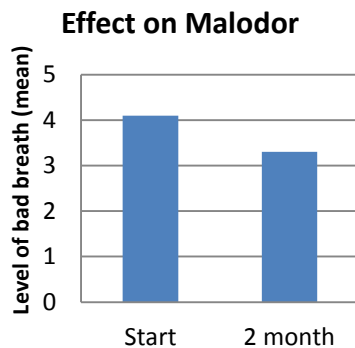
**Product:** ProDen PlauqeOff<sup>®</sup> dried powder.

**Dosage:** ½-2 scoops dependent on dog size. One scoop is 330 mg.

**Analytical methods:** Questionnaires with report from owner. Breath ranking 1-10, O’Leary’s plaque index, calculus tenacity ranking 1-10. The oral health ranking was done just before starting the intervention and after 2 month intervention.

**Instructions to pet owners:** Continue ordinary dental care regime.

**Results:** For statistics Pearson’s correlation coefficient was used and a true relationship was seen. T-test with a probability of  $p=0,05$  was performed and showed significant results for the three measured endpoints. All participants were satisfied.





## A Clinical Study to Determine the Effectiveness of Maritime Algae on dogs (Japan study)

- Aim: To determine the effectiveness of the alga on plaque, tartar, malodor and bleeding.
- Type of study: Open pilot intervention study.
- Endpoints: Plaque, malodor, bleeding.
- Responsible: Kyoritsu Seiyaku Corporation, Tokyo, Japan.
- Place: Tokyo, Japan.
- Time: 2010.
- Participants: 8 dogs with their owners.
- Duration: 1-4 month.
- Product: ProDen PlaqueOff® dried powder.
- Dosage: ½-2 scoops dependent on dog size. One scoop is 330 mg.
- Analytical methods: Questionnaires with report from owner/pet shop on plaque, tartar, breath odor and bleeding. Ranking, range 0-3, was done once a week.
- Results: No statistics. Result experienced as good - very good by owners and pet shop. Dog owners satisfied.

# A Clinical Study to Determine the Effectiveness of Maritime Algae on dogs (Varberg study)

Aim: To determine the effectiveness of the alga on malodor and calculus.

Type of study: Open pilot intervention study.

Endpoints: Malodor, calculus.

Responsible: A-L- Sörensson, Varberg, Sweden.

Place: Varberg, Sweden.

Time: 2007-2008.

Participants: 9 dogs and 1 cat with their owners.

Duration: 6 month.

Product: ProDen PlaqueOff<sup>®</sup> dried powder.

Dosage: ½-3 scoops per day dependent on weight of the animal. One scoop is 330 mg. Four pet owner were advised to increase the dose 50-100% after 2 month.

Analytical methods: The amount of calculus was ranked after 2, 4 and 6 month by a veterinarian and the amount of malodor was ranked both by the pet owner and the veterinarian. A scale from 0 to 3 was used. Porosity of the calculus was analysed by a veterinarian after 6 month.

Results: A significant ( $p < 0.001$ ) reduction of bad breath and calculus was seen (figures). At the end of the study 9 of 10 animals were rated to have much better calculus status and 8 of 9 animals were rated to have a much better or better malodor status. The veterinarian experienced a softer calculus which was easy to remove after 6 month.

fig 1  
Tandsten

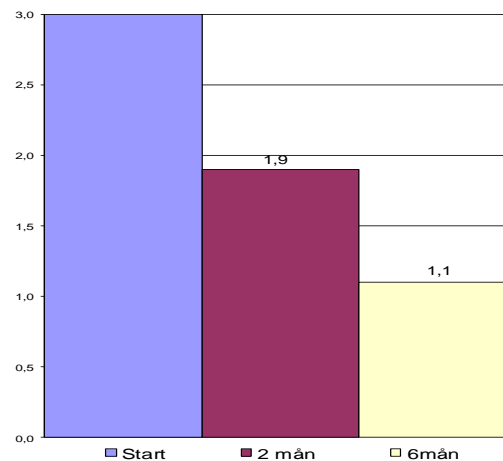
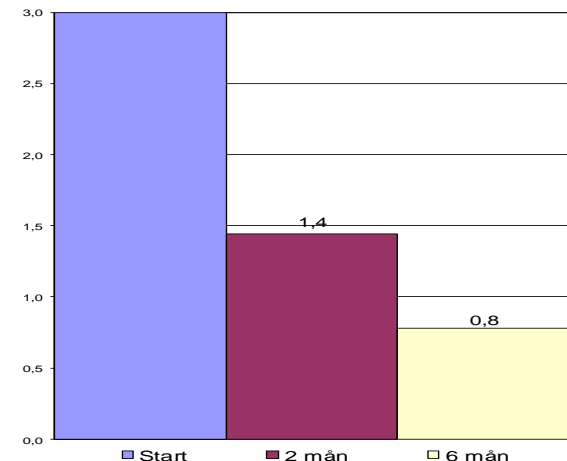


fig 2  
Andedräkt





## Effects of *Ascophyllum nodosum* contained in supplement on oral health index in dogs and cats (Poland study)

ProDen PlaqueOff®

- Aim: To evaluate the clinical effects of a formulation containing *Ascophyllum nodosum* in cats and dogs.
- Type of study: Controlled study.
- Endpoints: Primary endpoint Oral Health Index (OHI) including lymph node conditions, dental lesions, calculus and plaque.
- Responsible: J. Gawor, K. Jodkowska and M. Jank.
- Place: Veterinary clinics and university in Krakow and Warszawa, Poland.
- Time: 2013.
- Participants: Active group 12 cats and 12 and control group 6 cats and 6 dogs.
- Duration: 6 weeks.
- Product: Active ProDen PlaqueOff® dried powder, control group no addition.
- Dosage: Cats and dogs up to 10 kg b.w. – ½ - 1 cup of the product, dogs over 10 to 25 kg b.w. – 1-2 cups daily, dogs over 25 kg – 3 cups daily. One scoop is 330 mg.
- Analytical methods: Oral health examination method according to Usmiech Pupila (Pet's smile) prevention action and course. Lymph nodes, dental lesions, tartar and dental plaque was measured on a scale 0-2 and results was used as a oral health index (OHI). Examination was done on day 0, 2 weeks, 4 weeks and 6 weeks.
- Results: The study groups showed a deterioration of oral health during the 6 week study period which was significant less in the active group  $p=0,017$  for dogs and  $p=0,006$  for cats.
- Publication: J. Gawor, K. Jodkowska and M. Jank. Effect of an *Ascophyllum nodosum* formulation. Weterynaria W Praktyce 2013 10:74-79.

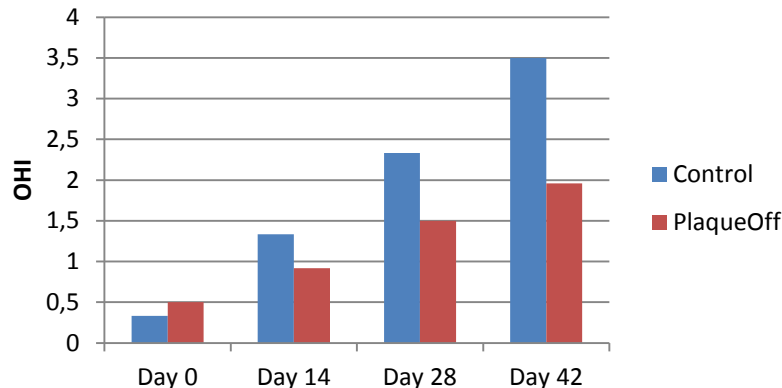


## Effects of *Ascophyllum nodosum* contained in supplement on oral health index in dogs and cats.

ProDen **PlaqueOff**<sup>®</sup>

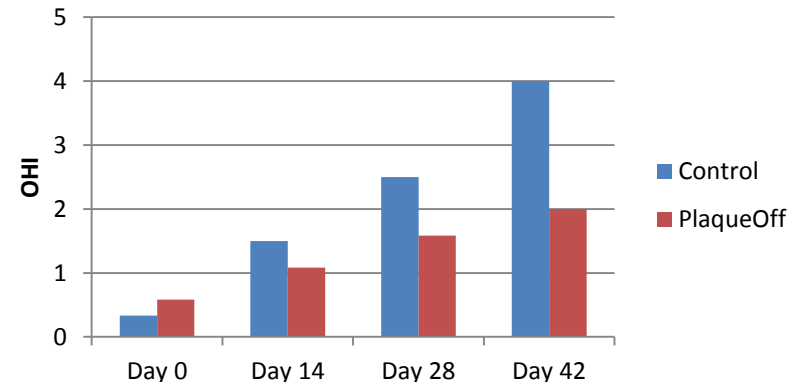
Results: ProDen PlaqueOff supplementation of dogs and cats diet significantly reduced the speed of oral health deterioration after routine dental cleaning procedure.

### DOGS



Oral health index in dogs from the control group and the group receiving the product with *Ascophyllum nodosum*. Application of the product for 6 weeks resulted in a lower increase of OHI which was statistically significant ( $p=0.017$ )

### CATS



Oral health index in cats from a control group and a group of cats receiving the product with *Ascophyllum nodosum*. Application of the product for 6 weeks resulted in a lower increase of OHI which was statistically significant ( $p=0.006$ )



# Evaluation for the Effectiveness of ProDen PlaqueOff on the Reduction of Plaque, Calculus, Gingivitis and Oral Malodor in Adult Beagles.

**ProDen** PlaqueOff®

## Safety measures included. (Summit Ridge Farm study)

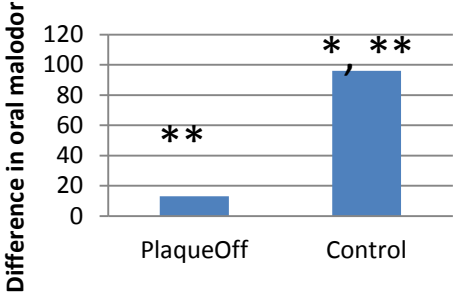
- Aim: To investigate the influence of ProDen PlaqueOff® on plaque, calculus, gingivitis and malodor. Blood parameters for safety.
- Type of study: Parallel controlled study.
- Endpoints: Plaque, calculus, gingivitis and halitosis.
- Safety evaluation: Weight, appearance, salivary and urinary pH, 33 blood parameters.
- Responsible: CRO Summit Ridge Farm, Pennsylvania, US.
- Place: Summit Ridge Farm, Pennsylvania, US.
- Time: 2007.
- Participants: In total 3x30 dogs. 2x30 dogs with clean mouth and 30 dogs with dirty mouth. Weight 8,5-13,5 kg, Age 14 month-7 years.
- Duration: 88 days.
- Product: Active ProDen PlaqueOff® dried powder sprinkled over daily feed, control same daily feed without any addition.
- Dosage: Dose dogs < 10kg ½ scoop (one scoop 0.33 mg), 10-25 kg 1 scoop, >25 kg 2 scoops.
- Analytical methods: Oral malodore, analyse with halometer. Gingivitis, modified gingival index based on Lobene et al. Calculus: modified Schiff method. Plaque, modified Quigley and Hein method.
- Results main endpoints: In the group of dogs that were not orally cleaned before the start (dirty mouth) malodor and calculus increased significantly in the control group but not in the active group. A tendency for increased plaque and gingivitis was seen in the control group but not in the active group. For malodor the difference in change of malodor between the active group and the control group was large (increase in control group 96 and in active group 13), and close to significant ( $p=0,065$ ). In the clean mouth groups no differences between the groups could be seen. A dose response analyse was done for malodor using the data from the dirty mouth group. The scores for the difference in malodor between day 0 and day 84 was 96, 34 and -4 for the control, low dose and high dose respectively.
- Conclusion from safety evaluation: ProDen PlaqueOff® is safe for dogs at the dose level 17-30 mg/kg bw, which corresponds to the level recommended for daily dose in the package labelling. No biologically significant changes were observed in the analyses of body weights of dogs, serum chemistry, complete blood count, salivary pH, urinary pH and urinary specific gravity. Statistical analyses for comparison were made between control and treatment groups and between values in the initial day and at day 56.



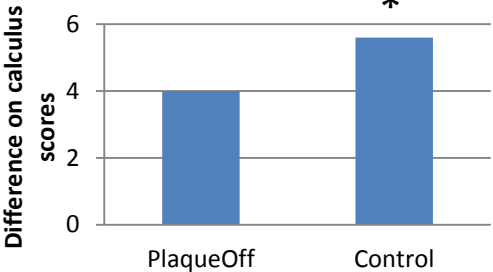


# Evaluation for the Effectiveness of ProDen PlaqueOff on the Reduction of Plaque, Calculus, Gingivitis and Oral Malodor in Adult Beagles. Difference from start.

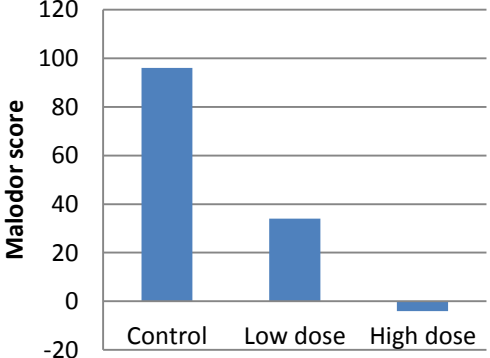
### Influence of ProDen PlaqueOff on oral malodor



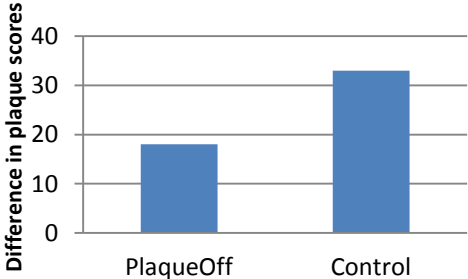
### Influence of ProDen PlaqueOff® on calculus



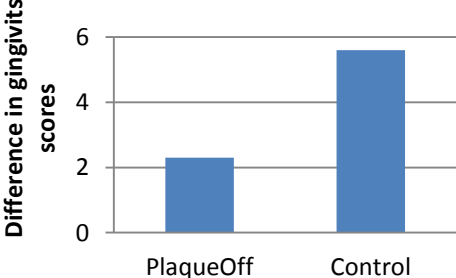
### Influence of ProDen PlaqueOff on oral malodor - dose response effect



### Influence of ProDen PlaqueOff® on plaque



### Difference of PlaqueOff on gingivitis



\*Significant change from start in the group ( $p < 0.05$ ),  
\*\*  $p = 0.065$  for difference between control group and ProDen PlaqueOff®



## Influence of PlaqueOff® Animal on plaque and calculus formation in dogs (Helsingborg study)

- Aim: To investigate the influence of ProDen PlaqueOff® on plaque and calculus.
- Type of study: Randomised, double-blind, placebo-controlled trial.
- Endpoints: Plaque, calculus, halitosis, thyroid hormones.
- Responsible: L. Wikhamre, E. Ellström, G. Bratthall, Periodontology, Malmö University/Veterinary clinic Helsingborg, Sweden.
- Place: Helsingborg, Sweden.
- Time: 2010.
- Participants: 60 dogs included, 44 dogs completed the study.
- Duration: 6 month.
- Product: Active ProDen PlaqueOff® dried powder, placebo dried brewers yeast.
- Dosage: ½-2 scoops dependent on dog size. One scoop is 330 mg.
- Analytical methods: The endpoints were analysed at start and after 6 month. Method for plaque and calculus analyses: Plaque index (PII) and calculus index registered according to Green&Vermillion's Oral Health Index Short Form (Green & Vermillion 1960) and owner answered a questionnaire.
- Results: Both groups demonstrated statistically reduced indices of plaque but without any statistical significant difference between the groups. A statistical improvement in both active and control was reported by owners for breath. Tendency for significant better improvement in active group compared to placebo (p=0.06), owners observation. The authors draw the conclusion that "it is possible that the owners increased interest for oral hygiene of their dogs masked a difference between test and control dogs". Effect on THS thyroid hormone analysed and all values in normal range.



# Conclusions from animal studies on ProDen PlaqueOff®

ProDen PlaqueOff®

## **Initial studies - open pilot studies**

- Cypress study: 10 participants. Significant reduction of malodor, plaque and calculus after 2 month compared to start.
- Japan study: 8 participants. Owner and pet shop personnel experienced a good – very good effect on plaque, malodor and bleeding.
- Varberg study: 10 participants. Significant ( $p \leq .001$ ) reduction of malodor and calculus after 2 and 6 month compared to start.

## **Controlled study**

- Poland study: 24 participants in active and 12 in control group. Results: The study groups showed a deterioration of oral health during the 6 week study period which was significant less in the active group  $p=0,017$  for dogs and  $p=0,006$  for cats.

## **Parallel controlled study**

- Summit Ridge Farm: 3x30 participants, 1x30 in “bad breath group”. Significant increase in malodor and calculus and tendency for significant increase of plaque ( $p=0,092$ ) and gingivitis ( $p=0,066$ ) in control group but not in active group after 84 days compared to start. Close to significant ( $p=0.065$ ) higher malodor in control than in active groups. Tendency for a dose response effect.

## **Randomised double blind placebo controlled study**

- Helsingborg study: 60 (44) participants. Significant reduction of plaque and calculus formation after 6 month compared to start. Tendency ( $p=0.06$ ) for better improvement of malodor in active group.

**Conclusion:**  
Studies have shown a consistent effect on malodor, calculus, plaque and gingivitis of ProDen PlaqueOff®. Results include a significant difference in Oral Health Index and close to significant better effect on malodor using ProDen PlaqueOff® compared to control.