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Hill's* Prescription Diet* Feline t/d*: Results of a Field Study

INTRODUCTION

Periodontal disease is the most common acquired oral disease in cats ⁽¹⁾. The development of periodontal disease is related to breed, age, nutrition, food characteristics, chewing behaviour, immune competence and systemic health. Plaque and calculus formation plays a pivotal role in the onset of periodontal disease ⁽²⁾. Periodontal disease starts with gingivitis, which is still reversible but can progress and lead to destruction of soft tissue attachment and loss of supportive bone structures. In this stage periodontitis is present. Periodontitis is irreversible and can only be controlled by mechanical cleansing in combination with strict oral hygiene measures.

Several studies have focused on regimens to prevent periodontal disease in cats. These studies showed that daily tooth brushing was the most effective method ^(3,4). Our aim was to compare 3 dental home care regimens, including one group with a tooth brushing regimen and two groups with different dental care foods, with a control group.

MATERIAL AND METHODS

The study included 88 client-owned cats submitted for routine annual checkups and selected for gingivitis and calculus. The cats were randomly allocated to four groups. All cats were evaluated for general health status and dental status prior to inclusion in the study. Cats were excluded from the study for the reasons listed in TABLE 1.

An owner's consent sheet was signed to lay down the examinations at three and six months after initiation of the study.

At the start of the study, before professional cleaning, the amount of plaque, calculus, and gingivitis was determined under general anaesthesia according to the guidelines of the VOHC. The amount of calculus was determined by visual inspection and by using a pointed explorer. Calculus formation was evaluated on a scale from 0 to 4 by determining the amount of coverage of the buccal side of the crown of the canine teeth, premolars and carnassial teeth for each individual tooth (TABLE 2).

	TABLE 1
	Plasma creatinine concentration of > 180 µmol/l
	A missing canine or carnassial teeth
	The presence of odontoclastic resorptive lesions
	Age: < 10 months or > 12 years
	Absence of gingivitis
	A positive titre for FeLV and/or FIV
	Recent medication with corticosteroids, progestins, or antibiotics

Table 1. Exclusion criteria

	TABLE 2
	0 = no calculus
	1 = 0 - 25% calculus coverage
	2 = 25 - 50% calculus coverage
	3 = 50 - 75% calculus coverage
	4 = 75 - 100% calculus coverage

Table 2. Calculus grading

	TABLE 3
	0 = no plaque
	1 = 0 - 25% plaque coverage
	2 = 25 - 50% plaque coverage
	3 = 50 - 75% plaque coverage
	4 = 75 - 100% plaque coverage

Table 3. Plaque grading

	TABLE 4
	0 = normal gingiva
	1 = mild inflammation, slight redness
	2 = moderate inflammation and redness, no bleeding on probing
	3 = moderate inflammation with severe redness, bleeding on probing
	4 = severe inflammation and redness, edema, ulceration, and spontaneous bleeding

Table 4. Gingivitis grading

	TABLE 5	
Group	n	Description of the home care regimen
1	23	Small size kibble with special structure ¹
2	23	Small size kibble with same formula as the group 1 food, but without the special structure ² ; plus tooth brushing
3	21	Control group; Small size kibble with same formula as the group 1 food, but without the special structure ² .
4	21	Large size kibble with special structure ³

Table 5. Dental home care regimens.

¹ Hill's* Science Plan* Feline Oral Care Adult

² Hill's* Science Plan* Feline Oral Care formula without special structure

³ Hill's* Prescription Diet* Feline t/d*

Plaque was determined in a similar fashion, using a disclosing solution, and again by evaluating the coverage of buccal side of the crown (TABLE 3). The extent of gingivitis was determined on a scale from 0 to 4 by visual signs of inflammation and the bleeding tendency after probing with a periodontal gauge (TABLE 4). All cats were evaluated in this way by the same investigator. The individual scores of the cats were registered.

Professional cleaning of the teeth of the cats was performed at day 0 under general anaesthesia, using hand instrumentation. After calculus removal all teeth were polished using a low-speed handpiece and fine pumice.

The cats were discharged with their specific dental home care regimens. The 4 treatment groups are described in TABLE 5. The owners of group 2 were instructed about the tooth brushing, which was performed on an every other day basis, using a toddler toothbrush.

Three and 6 months after the initial cleaning all cats were anaesthetised and evaluated for calculus formation, amount of plaque, and degree of gingivitis. No cleaning or polishing of the teeth was performed at 3 and 6 months. All individual scores of each cat were recorded.

Statistical analyses were performed using the SPSS 10.1 statistical package (SPSS Inc., Chicago, Illinois, USA). The General Linear Model for repeated measures for the 4 groups was executed, using the mean grading of the calculus, plaque, and gingivitis score of each cat. The score at day 0 was used as a covariant to compare the 3- and 6-months results between the groups. The level of significance was set at P < 0.05.

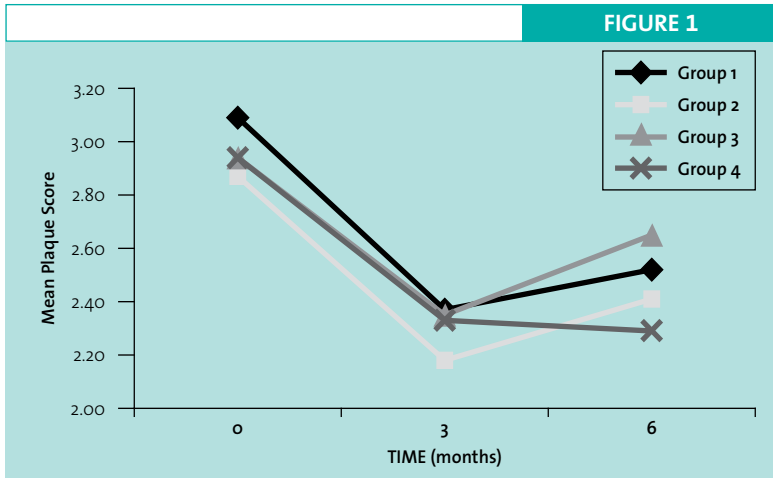


Figure 1. Mean plaque scores at day 0, and at 3 and 6 months.

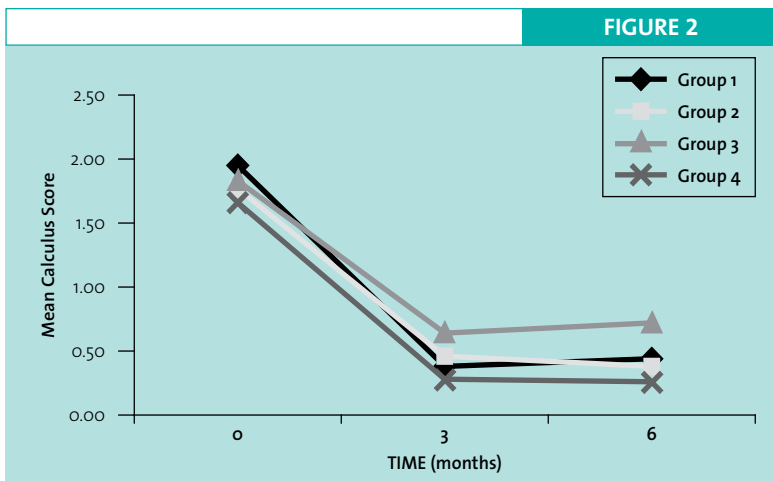


Figure 2. Mean calculus scores at day 0, and at 3 and 6 months.

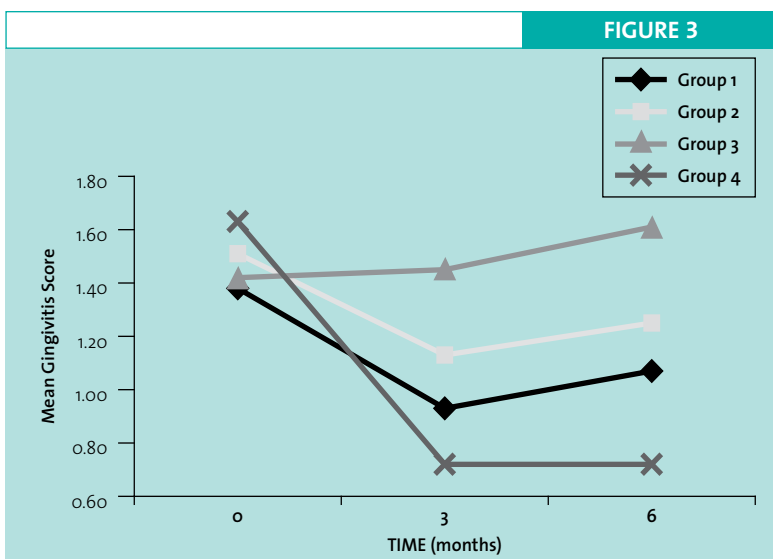


Figure 3. Mean gingivitis scores at day 0, and at 3 and 6 months.

RESULTS

The mean plaque, calculus, and gingivitis scores at day 0 and at 3 and 6 months after professional dental cleaning are depicted in FIGURES 1 to 3. It was interesting to note that, in contrast to the other groups, in group 4 (Hill's* Prescription Diet* Feline t/d*) the plaque accumulation score at 6 months was lower than at 3 months. During the evaluation of the calculus formation group 4 (Hill's* Prescription Diet* Feline t/d*) showed the lowest scores both at 3 and 6 months after dental cleaning. Whereas all groups showed a progression in their gingivitis scores after dental cleaning, group 4 (Hill's* Prescription Diet* Feline t/d*) demonstrated a very low and static level of gingivitis.

There were no statistical differences between the 4 groups at the start of the study and thus prior to the initial removal of the plaque and calculus, and polishing of the teeth. No significant differences were found at any time for the amount of plaque in the 4 groups. For calculus formation statistically significant differences were found between the control group and the other three groups, when comparing the combined scores at 3 and 6 months. The largest difference in calculus formation was seen between the control Group 3 (Control) and the large-size dental kibble Group 4 (Hill's* Prescription Diet* Feline t/d*) (TABLE 6).

The extent of gingivitis showed a significant difference between the two dental home care foods (Groups 1 and 4) and Group 3 (Control). The largest difference in gingivitis grade was found between the large-size dental kibble (Hill's* Prescription Diet* Feline t/d*) and Group 3 (Control). The large-size dental kibble group demonstrated significantly lower gingivitis scores than the two treatment groups and the control group (TABLE 7).

DISCUSSION

This study demonstrated that after professional dental cleaning the large-size dental home care food (Group 4 - Hill's* Prescription Diet* Feline t/d*) was most efficacious in controlling both calculus formation and the development of gingivitis. The fact that no statistical differences were found for plaque accumulation was to be expected, since plaque buildup was graded after a 24-hour fasting period prior to general anaesthesia. During this period plaque will accumulate and the beneficial effect from the home

care regimens will be obscured. It is interesting to note that in these client-owned cats both dental home care diets were more efficacious in preventing gingivitis than tooth brushing ⁽⁴⁾. The low compliance of tooth brushing in cats plays an important role in this finding. In our study only 40% of the owners claimed to still brush their cats teeth at 6 months after professional cleaning. In conclusion Hill's* Prescription Diet* Feline t/d* due to its size and structure is very effective in preventing calculus formation and the development of gingivitis.

TABLE 6		
Group I	Group II	Mean difference Group I and II
1	2	-0.07
	3	-0.31[#]
	4	0.02
2	1	0.07
	3	-0.23[#]
	4	0.09
3	1	0.31[#]
	2	0.24[#]
	4	0.33[#]
4	1	-0.02
	2	-0.09
	3	-0.33[#]

Table 6. Statistical results mean calculus score
[#] The mean difference is significant at the 0.05 level

TABLE 7		
Group I	Group II	Mean difference Group I and II
1	2	-0.12
	3	-0.51[#]
	4	0.41[#]
2	1	0.12
	3	-0.39[#]
	4	0.53[#]
3	1	0.51[#]
	2	0.39[#]
	4	0.92[#]
4	1	-0.41[#]
	2	-0.53[#]
	3	-0.92[#]

Table 7. Statistical results mean gingivitis score
[#] The mean difference is significant at the 0.05 level

REFERENCES

1. Lund EM, Armstrong PJ, Kirk CA, et al. Health status and population characteristics of dogs and cats examined at private veterinary practices in the United States. J Am Vet Med Assoc 1999; 214: 1336-1341.
2. Clarke DE, Cameron A. Relationship between diet, dental calculus and periodontal disease in domestic and feral cats in Australia. Aust Vet J 1998; 76 (10): 690-693.
3. Gorrel C, Inskip G, Inskip T. Benefits of a "dental hygiene chew" on the periodontal health of cats. J Vet Dent 1998; 15 (3): 135-138.
4. Ingham KE, Gorrel C, Blackburn JM, Farnsworth W. The effect of toothbrushing on periodontal disease in cats. J Nutr. 2002; 132: 1740S-1741S.



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Partial Extraction in Cats with Gingivitis- Stomatitis- Pharyngitis-Complex – Beneficial Effects of a Recovery Food

INTRODUCTION

Gingivitis-stomatitis-pharyngitis-complex (GSP) is a debilitating disease in cats. Its exact aetiology is still unknown, and may be multifactorial⁽¹⁻³⁾. The major symptoms in cats are halitosis, pain, reluctance to eat, and consequent weight loss. Partial extraction of the teeth, including all premolars and molars, has been shown to be the therapy of choice⁽⁴⁾. Due to the chronic oral pain many of these cats have a negative energy balance. Therefore sufficient intake of high-quality food after surgical treatment is essential. In this study we hypothesised that a recovery food would have a positive effect on body weight gain and soft tissue wound healing in the mouth after partial extraction.

MATERIAL & METHODS

This study included 28 client-owned cats with GSP. The cats were divided randomly into two groups of 14 cats. The cats' body weights were recorded, and the degree of lesions in the mouth was determined under general anaesthesia and all premolars and molars were extracted. One group (n=14) received the recovery food[‡] while the other group (n=14) were maintained on their usual commercial food. After 3 weeks the cats were weighed, sedated, and the degree of lesions was scored. In addition, the total length of gingival lesions was measured (in mm). After data collection statistical analyses were performed using Student's T-test and Wilcoxon test (SPSS 10.1). The level of significance was set at $P < 0.05$.

RESULTS

The mean period of acceptance of the recovery food[‡] was 7 days (ranging from 0 to 21 days). Three weeks after surgery (teeth extraction) only the group receiving the recovery food[‡] showed a significant gain in body weight and both the degree of severity and the length of gingival lesions were significantly lower in the cats fed the recovery food[‡].

[‡] Hill's[®] Prescription Diet[®] Canine/Feline a/d^{*}

DISCUSSION

These findings indicate that the cats in the first group had a better soft tissue healing in the mouth and a faster recovery of body weight. This study supports the use of this recovery food ⁽¹⁾ as a supportive measure for healing after partial extraction in cats treated for GSP.

REFERENCES

1. Diehl K, Rosychuk RA. *Feline gingivitis-stomatitis-pharyngitis*. *Veterinary Clinics of North America - Small Animal Practice* 1993; 23: 139-153.
2. Pedersen NC. *Inflammatory oral cavity diseases of the cat*. *Veterinary Clinics of North America - Small Animal Practice* 1992; 22: 1323-1345.
3. Williams CA, Aller MS. *Gingivitis/stomatitis in cats*. *Veterinary Clinics of North America - Small Animal Practice* 1992; 22: 1361-1382.
4. Fujita K, Sakai T. *Curative effect of tooth extraction on feline gingivo-stomatitis*. *Journal of the Japan Veterinary Medical Association* 1999; 52 (8): 507-511.

