



SA135P & SA136P

THE DIABETIC CAT: THEORY VS. REALITY, PARTS 1 and 2

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Overview of the Issue

The diabetic cat is the source of consternation for many, many veterinarians. In spite of great therapeutic success touted by academic studies, many of the “standard” recommendations don’t produce expected and promised results. These two practitioners, with nearly 50 years of clinical experience on hundreds of diabetic cats, will describe how they deal with these patients without the frustrations.

Objectives of the Presentation

To equip the practitioner to enjoy success in managing diabetic cats in a real world setting.

- 1) The Big Picture
 - a) Diabetes often occurs in the presence of other diseases, most of which cause insulin resistance.
 - b) We need to deal with them so we can manage diabetes well.
 - c) Diabetes is due to
 - i) Lack of insulin production
 - ii) Insulin resistance
 - d) To be successful we must treat both aspects of this disease.
 - e) To do that we must look for and resolve causes of insulin resistance.
 - i) Obesity
 - (1) RX: low carb high protein weight control diet with measured portions
 - ii) Chronic pancreatitis. (50% of newly diagnosed diabetics have an elevated fPL.)
 - (1) RX: Antibiotics? Anti-inflammatories (Cerenia, Denamarin, prednisolone? (2.5-5 mg/d)
 - iii) Periodontal disease.
 - (1) RX: Teeth cleaning; after 2-3 weeks of treatment but before regulation occurs.
 - iv) Bacturia
 - (1) Incidence: Norsworthy study = 2%; ABVP Diplomates = 6%
 - (2) RX: Antibiotics – Convenia a very good choice.
 - v) Other infections

(1) RX: Antibiotics – Convenia or oral fluoroquinolone

2) Tight Control Approach

a) Ref: J Feline Medicine & Surgery, August 2009

b) Why needed?

- i) In Germany and Australia (authors' homes) a veterinary product must be used first if one is available.
- ii) Veterinary insulin available: Caninsulin (same as Vetsulin); has a DOA of 8 hours.
- iii) The authors felt the need for a longer acting product because of the short DOA of Caninsulin.
- iv) The only choice available: glargine (Lantus)
- v) There was no protamine zinc insulin available in those countries.

c) Protocol

- i) 55 diabetic cats were treated with a tight glucose control protocol
 - (1) 209 owners of diabetic cats that were in the German Diabetes-Katzen Forum were solicited to participate.
 - (2) 117 were eligible and began the study
 - (3) 62 (53%) dropped out in less than 10 weeks for non-compliance
 - (4) 55 completed the study (26% of those solicited to participate and 47% of those that were eligible and began the study).
 - (5) Home glucose testing daily
 - (6) Glargine
 - (7) Canned ultra-low, carbohydrate diet

d) Results

- i) 84% went into diabetic remission if the protocol was started less than 6 months after the diagnosis was made or they had been on steroids prior to the onset of diabetes. (Note: This is misleading because many cats with steroid-induced DM will go into remission when steroids are withdrawn even if they are not put on insulin.)

e) Details of the protocol

- i) Diet: ultra-low carbohydrate diet
 - (1) Less than 10% metabolizable energy from carbs
 - (2) Canned only
 - (3) Most were commercial diets
 - (4) Some were home-made or raw meat diets.
- ii) Insulin
 - (1) Glargine
 - (a) The only long-acting insulin available in Germany (site of study).
- iii) Glucose Testing
 - (1) Glucose values were determined daily by the owner using a human glucometer
 - (2) An algorithm was given to the owners to direct dose changes.
 - (3) The average number of glucose tests performed per days was 5.
 - (a) Range of 3-7.
 - (b) At least 3 times per day was required to remain in the study.

f) My assessment

- i) This study shows that diabetes in cats can be well controlled or eliminated (remission) under ideal circumstances of an ultra-low carbohydrate diet, a long-acting insulin, and a rigid protocol.

- ii) Perspectives from Boarded Feline Practitioners
 - (1) On September 18, 2014 ten ABVP Feline Diplomates participated in a Diabetes Roundtable Discussion held in conjunction with the AAFP meeting. It was convened by Dr. Elaine Wexler-Mitchell who sent the following email:

“I don't know about you, but I feel frustrated about treating feline diabetes, and when I go to CE seminars and look up information on VIN, I don't agree with a lot of the recommendations. I have asked several other feline specialists about their experiences with feline diabetes, and I think others are frustrated too and not seeing the type of responses being presented in academia. At my practice, we have been reviewing our feline diabetic patients over the past few years and were surprised to see that more than 50% were not well regulated based on currently "accepted criteria."
 - i. Many ABVP Diplomates responded. Here are two:

“I also think ‘tight control’ measures are great for the unemployed...And, one trip to the ER with a hypoglycemic cat is \$1500.00 overnight in my area.” “My remission rates are also not that high. Did try a tight aggressive regulation right at diagnosis. Patient in remission and in hypoglycemic crisis in 5 days. So not as aggressive initially now.”
 - iii. My assessment: 1) Interesting, 2) Not sustainable, 3) Risky (hypoglycemia)

3) Traditional Approach

a) Diagnosis

- i) Diagnostic triad: hyperglycemia, glucosuria, and appropriate clinical signs
- ii) Confirmed with fructosamine.

b) Management

- i) Insulin (glargine) and a low carbohydrate diet are started, and the cat is discharged for home treatment.
 - (1) Some hospitalize the cat to get it regulated.
- ii) The owner monitors the cat's blood glucose 2-14 times per week per your instructions.
- iii) The owner calls for recommendations on dosage changes based on numbers gathered at home (home glucose testing).
- iv) The cat is checked by you:
 - (1) 1-4 times during regulation.
 - (2) Every 3-6 months thereafter.
 - (3) Anytime the home glucose numbers are outside 100-300 mg/dl (5.5-16.5 mmol/L).
- v) Each recheck includes a glucose curve and possibly a fructosamine. The average cost is \$300-500 for the recheck.
- vi) The Goal: Remission
- vii) The Expectation: bG 100-300 mg/dl
- viii) The cat lives happily ever after.

c) More comments from the ABAVP Diplomates:

- i) “I don't know about you, but I feel frustrated about treating feline diabetes, and when I go to CE seminars and look up information on VIN, I don't agree with a lot of the recommendations.”

- ii) "I have asked several other feline specialists about their experiences with feline diabetes, and I think others are frustrated too and not seeing the type of responses being presented in academia."

4) Loose Control Approach

a) Why I searched for an alternative:

- i) Too many euthanasias due to the financial and personal commitment required of owners, hypoglycemic episodes, home monitoring demands on the owner and the cat and the outcomes of glucose curves.
- ii) I was frustrated because I had patients that seemed to be doing well but had terrible blood glucose values.
- iii) Owners fed on my feelings and got discouraged, leading to more euthanasias.
- iv) I saw a disconnect between clinical signs and blood glucose values.
 - (1) Cats with "unacceptable" numbers (bG=400-500) were doing great and owners were happy.
- v) I became frustrated with glucose curves.
 - (1) Many/most were not "curves."
- vi) I had been using PZI since I graduated in 1972. I tried other insulins but saw no improvement in glucose numbers. I went back to PZI.
- vii) Then I read this quote from Feldman and Nelson:

"Glycemic control is attained when clinical signs of diabetes have resolved, the cat is healthy and interactive in the home, its body weight is stable, the owner is satisfied with the progress of therapy, and, if possible, the blood glucose concentrations range between 100 and 300 mg/dl throughout the day." Veterinary Endocrinology, Feldman and Nelson, 1996, p.363

viii) My Response

- (1) I continue to use PZI.
- (2) I discontinued the use of glucose curves.
- (3) I paid more attention to the cat if there was a conflict between the cat and the blood glucose levels.
- (4) Data from the ABVP Diabetes Roundtable

	Loose Control (GDN)	Traditional Approach
Remission	30%	25%
Became diabetic post remission	18%	41%
Days to Death (all cats)	158	116
Longevity for Survivors (days)	472	438
Home Glucose Testing	2.8%	26.7%
Became Hypoglycemic (% of treatment days)	0.06	0.13%
Ate LCHP Diet	74%	43%
Insulin	PZI = 92%	Glargine = 77%

- (5) Dr. Jennifer Olson Lavalley's experience before, during, and after working at Alamo Feline Health Center (Dr. Norsworthy).

- (a) Traditional training for diabetic regulation from vet school, internship, general practice, and emergency prior to AFHC. Similar experiences to Dr. Norsworthy and frustrated with diabetes in cats.
 - (b) Felt that glucose curves were often headaches to perform and interpret.
 - (c) At AFHC, found loose control allowed a better client/cat relationship via more frequent visits, which was tolerable to the owner due to less cost per visit.
 - (d) Experienced better clinical decision making and actually lived the mantra “too little insulin is better than too much.”
 - (e) October 2014, bought a feline exclusive practice and has happily applied used loose control on newly diagnosed diabetic cats and as a new option for poorly regulated diabetics.
- b) Diagnosis
- (1) Diagnostic Triad: hyperglycemia, glucosuria, clinical signs of PU/PD/PP/WL
 - (2) If questionable: Fructosamine OR Repeat labs in 1-2 weeks.
 - (3) Reveals Two Groups
 - (a) Borderline Diabetics: bG < 400 + clinical signs + glucosuria (about 10%)
 - (b) Overt Diabetics: bG > 400 + clinical signs + glucosuria (about 90%)
- c) Regulation: Borderline Diabetics
- i) Address insulin resistance
 - (1) Convenia
 - (2) Treat pancreatitis PRN
 - ii) Low carb high protein diet
 - iii) No insulin
 - iv) Recheck q2-4-6w to determine remission, continuance, or overt diabetes
 - (1) In all three situations, continue LCHP diet.
- d) Regulation: Overt Diabetics
- i) Address insulin resistance.
 - (1) Convenia
 - (2) Treat pancreatitis PRN
 - ii) LCHP diet
 - iii) Protamine zinc insulin (ProZinc): ~ 2 units per cat q12h SC
 - iv) Recheck in 5-10 days
 - (1) Weight – compared to last weight taken (1 week ago)
 - (2) Thirst, urine output, appetite – compared to last and to normal
 - (3) “How is the cat feeling?” Subjective answer but very important
 - (4) Check bG at 6 or 12 hrs. post insulin without fasting.

6 hrs. Post Insulin	12 hrs. Post Insulin
Nadir	Peak
Predicts Hypoglycemia Better	Predicts Hyperglycemia Better
Less Predictable	More Predictable
Clients Less Available	Clients More Available
Considered the Ideal Time	95% of Our Rechecks

- v) Rechecks during regulation process
 - (1) Every 5-14 days
 - (2) Same questions as above
 - (3) bG at 12 (or 6) hours
 - (4) Adjust insulin dose PRN
- vi) Rechecks: Long term
 - (1) ~ every 4-6 weeks
 - (2) ~ 1-2 weeks if dose is changed
 - (3) Same questions
 - (4) bG at 12 (or 6) hours
 - (5) Adjust insulin dose PRN.
- e) Insulin Adjustments (General Rules!)
 - i) Consider and factor in the Stress Factor.
 - (1) How long was the drive to get to my office?
 - (2) How did the cat act during the drive?
 - (3) Did it urinate or defecate?
 - (4) Is it showing aggression to me and my staff?
 - (5) Look at the heart rate, respiration rate, and for dilation of the pupils.
 - ii) It is always better to underdose than to overdose.
 - iii) Adjust the dose slowly and conservatively.
 - iv) Cat tolerate bG of 400-500 mg/dl much better than you were taught and better than dogs or humans.
 - v) Adjustments are largely based on clinical signs.
 - vi) If the clinical signs conflict:
 - (1) Weight trumps others
 - (2) Don't ignore marked PU/PD.
 - vii) Be aware of Pancreatic Rebound
 - (1) As the insulin dose increases, more beta cells become functional again.
 - (2) Increasing the dose too rapidly can result in hypoglycemia.
 - (a) Due to return in pancreatic function.
 - (b) Due to onset of remission.
 - viii) Dose changes
 - (1) Based on 12 hour rechecks.
 - (2) Ideal: 300-350 mg/dl.
 - (3) Good: 300-400 mg/dl
 - (4) Usually good: 400-450 mg/dl
 - ix) If the blood glucose is below the ideal
 - (1) 250-300
 - (a) Clinical signs will be very well controlled
 - (i) If not, check the glucometer
 - (b) If the dose is 1-2 units: reduce by 0.5-1 unit.
 - (c) If the dose is 3+ units: reduce by 1-2 units.
 - (2) 180-250
 - (a) Clinical signs will be gone.
 - (b) Owner will be extremely happy.
 - (c) If not, check the glucometer.

- (d) Reduce the dose by 50%
- (e) Recheck in 1 week: remission is possible.
- (3) < 180
 - (a) Stop insulin for 2-4 days then recheck bG to see if the cat is still diabetic.
 - (i) Any time of day is acceptable because the cat is not getting insulin
 - (ii) If bG < 200: No insulin; remission is present.
 - (iii) If bG 200-300: No insulin; recheck in 1-2 weeks.
 - (iv) If bG > 300: Resume insulin at 50% of prior dose.
 - (b) Diet: If bG is stopped, continue the LCHP diet to reduce or stall recurrence.
- x) If the blood glucose is above the ideal
 - (1) 400-500 and the clinical signs are controlled.
 - (a) No dose change.
 - (b) Consider stress hyperglycemia
 - (i) Fructosamine OR
 - (ii) Recheck in 2 weeks.
 - (2) 400-500 and the clinical signs are not controlled (especially weight).
 - (a) If dose is 1-3 units: increase by 0.5 units per dose.
 - (b) If dose is 3.5+ units: increase by 1.0-1.5 units per dose.
 - (3) 400-500
 - (a) Always increase the dose conservatively.
 - (b) Recheck in 1-2 weeks.
 - (c) Adjust again conservatively.
 - (4) 500-600
 - (a) Do not panic.
 - (b) Is the cat stable?
 - (i) Eating well, hydrated, bright and alert, interactive with the family?
 - (ii) If you are nervous, check for ketonuria.
 - (c) Continue as prior instruction above based on clinical signs.
 - (d) Do not over-react by raising the insulin dose too much.
 - (i) You may induce hypoglycemia.

5) Remission

- a) Norsworthy Study – to be published
 - i) Time frame: 2005-2012
 - ii) 98 cats; all died (chose this criteria so longevity could be calculated.)
 - iii) Notable
 - (1) 78 other cats were alive at the end of the study and excluded.
 - (2) Dr. N saw 47 diabetic rechecks in December 2012.
 - (3) All cats on ProZinc (protamine zinc insulin)
 - (4) 69% ate a low carb high protein diet.
 - iv) Remission cats lived longer (median: 899 days vs. 527 days)
 - v) But, without remission cats lived up to 1732 days (4.75 years)
 - vi) Remission is desirable but not essential for long-term management and survival.
 - vii) Factors for remission
 - (1) Exclusive LCHP diets\:#1 factor (2/3 of the cats in remission were on this type diet).

- (2) Co-morbidities: #2 factor (Cats with renal disease had a median survival of ¾ months)
- (3) Successful treatment for insulin resistance also very important.
- (4) Habitat: indoor only vs. outdoor only vs. both
 - (a) Affects regularity of insulin administration.
 - (b) Make diet control very difficult.
 - (c) Remission rates: 80% were indoors only; 0 were outdoors only.
- (5) Gender
 - (a) 31% of males and 3% of females went into remission.
- (6) Owner commitment and compliance
 - (a) Husband vs. wife
 - (b) Lifestyle
 - (c) How special is *this* cat?
- (7) Survival for at least 3 days: 19% of the cats in the study did not – no chance for remission.
- (8) Canned vs. dry vs. both: Not a factor
- 6) Referral/University Cases vs. Primary Care Cases
 - a) 19% of my cases survived 3 days or less – not referred
 - i) Most severely ill with DKA or co-morbidities: renal, cancer, etc.
 - ii) Most of these cats were the victim of owner issues
 - (1) Financial
 - (2) Commitment to *this* cat.
 - b) Therefore ...
 - i) Survival times and remission rates are going to be more in a referral setting; the 0-3 days survival group has been largely eliminated.
 - ii) Do not expect your numbers to be as good as those of university studies.
 - iii) Studies on remission rates that focus only on insulin type and do not account for these other factors will have misleading conclusions.
 - iv) My remission rate was 38% in this study group, which was a different group than the ABVP Diabetes Roundtable group.
- 7) The glucose curve
 - a) JAVMA 2/1/03: “Although the serial blood glucose curve appears to be a useful test for distinguishing levels of glycemic control in a group of diabetic dogs, it seems to be an unreliable clinical tool for evaluation of insulin dose in individual diabetic dogs. There was marked disparity between the theoretical recommendations for dose adjustment based on the curves obtained on consecutive days, particularly in dogs with lower minimum blood glucose concentrations, which represented those with better glycemic control.”
 - b) JAVMA 4/1/07: There was high variation in nadir, time to nadir, maximum bG, and mean bG. There was no difference in home and clinic results. Paired home curves were in agreement in 6/14 cats (43%).
 - c) Five Minute Veterinary Consult, Diabetes Mellitus without Complications, Cats; 3rd, 4th, and 5th editions. (D. Greco): “Glucose curve – not helpful in cats.”
- 8) Insulin Choices
 - a) Lente (Vetsulin – United States; Caninsulin – Canada, Europe, New Zealand, and Australia)

- i) 100% pork; therefore, best for dogs.
 - (1) Approved in dogs first, but has been approved in cats.
- ii) U-40 concentration
- iii) Intermediate acting: ~8 hour duration of action
- iv) "Discard after 42 days."
- b) NPH (Humulin N)
 - i) Also intermediate acting: ~8 hour duration of action
 - ii) Human origin; possibility some antibody reactions that inactivate the insulin.
- c) Protamine Zinc
 - i) Made by Boehringer-Ingelheim
 - ii) U-40 concentration
 - iii) A recombinant product – no antibody formation.
 - iv) My insulin of choice for 40 years.
 - v) Our cost: ~\$75 per bottle
 - vi) Our retain: \$110 per bottle
 - (1) Permits sale to most clients; we sell about 25 bottles per month (X \$35 = \$875/mo).
 - vii) Gives excellent results permitting me to treat many diabetics for many years and to address the other health issues as they age.
 - viii) Compounded PZI: JAVMA 3/1/12
 - (1) Problems found in 11/12 compounded products: lack of expiration date or lot number on the vial, lack of identification of the species of origin, unacceptably high endotoxin concentration, pH above or below the recommended range, low total insulin concentration, zinc concentrations below or above acceptable limits, variability in insulin concentration, unacceptably high concentrations of insulin in the supernatant.
- d) Glargine (Lantus)
 - i) Initial interest based in Europe and Australia where the law requires the use of a veterinary product if one is available. The only one was Caninsulin, a lente product with a duration of action of about 8 hours.
 - ii) When a longer acting insulin was needed, the only one available was glargine; there was no PZI product available.
 - iii) Many cats have a good response so it is widely used.
 - iv) U100 product
 - v) Do not dilute it because any change in pH inactivates the product.
 - vi) Currently sells for ~\$225-250 per bottle.
 - vii) A recombinant product: no antibody formation.
 - viii) Observations by Jacquie Rand (website)
 - (1) "For many cats, the time at which the nadir (lowest) glucose concentration occurs is often not consistent from day to day, or between cats. Sometimes it occurs between the two doses, but sometimes the nadir occurs around the time of the next dose."
 - (2) "Most commonly the highest glucose concentrations occur in the morning and the lowest in the evening."

- (3) “Some cats consistently have their nadir glucose concentration in the evening just before the next insulin injection, and less commonly, it occurs around the time of their morning injection.”
- ix) Pharmacodynamics of Insulin Detemir and Insulin Glargine Assessed by an Isoglycemic Clamp Method J Vet Intern Med 2010;24:870-874.
- (1) “The average time-action curve (Fig. 1K) suggests that both analogs are relatively flat curves. Considering the individual time action curves, however, it is clearly not safe to assume that either insulin detemir or insulin glargine is long-acting and flat in any given patient. Fig. 1A-J.”
- (2) The duration of action in 50% of the cats in this study was less than 12 hours.
- (3) The duration of action of 30% was equal to or less than lente.
- x) Glargine in humans
- (1) Used as a background insulin.
- (2) Short-acting and intermediate-acting insulins are given several times per day on a PRN basis.
- (3) It was not designed to be the sole insulin product for diabetic humans.
- (4) About 3% of humans experience significant pain at the injection sites because it has a pH of 4.
- 9) Summary of the Loose Control Approach
- a) Realize that DM in cats is due to:
 - i) Lack of insulin production
 - ii) Insulin resistance
 - b) Diagnose and treat diseases causing insulin resistance.
 - i) Chronic pancreatitis
 - ii) Periodontal disease
 - iii) Infections anywhere
 - c) Place emphasis on two things:
 - i) Clinical signs (PU/PD/PP/WL)
 - ii) Glucose levels
 - d) Have a tolerance for hyperglycemia if the clinical signs are controlled.
 - i) Clinical signs are more important than glucose levels.
 - e) Do not perform glucose curves.
 - f) Do not do home glucose testing by the owner.
 - g) Use protamine zinc insulin (ProZinc); no glargine or lente.
 - h) Only use fructosamine levels uncommonly (for stress hyperglycemia cats including fractious cats).
 - i) Have owner feed, inject, and observe
 - j) I decide on insulin dose changes based on patient exams.

Summary

The diabetic cat offer treatment frustration to most veterinarians who treat cats. Diabetes mellitus in cats is usually due to a combination of insulin deficiency and insulin resistance. Both must be addressed to achieve success. Therefore, the first step is to diagnose and treat the causes of insulin resistance, which most commonly include chronic pancreatitis, bacterial cystitis or pyelonephritis, and periodontal disease. Urine culture and fPLI should be performed

on all newly diagnosed diabetic cats. The oral cavity should be examined for periodontal disease. Failure to diagnose and treat these problems will usually lead to therapeutic failure.

Insulin deficiency is treated with injectable insulin. In the United States the most commonly used insulin products include glargine, protamine zinc, and lente. Each has pros and cons, but the first two are long-acting and, therefore, generally preferred.

Diet is another important part of the therapeutic package. An ultra-low carbohydrate (carbs < 10%) diet is preferred. A canned product is usually more effective than a dry product, but many cats will not convert from exclusively dry food diets to canned products easily.

My preferred approach is best described as “loose control.” This means that regulation is based more on control of clinical signs than on trying to achieve “ideal” blood glucose levels (100-300 mg/dl). It recognizes that cats tolerate hyperglycemia better than other species. A protamine zinc insulin product is used on a q12h basis. Owners are not asked to check blood glucose levels at home.

When beginning the regulation process a low dose of insulin is used initially, usually 2 units q12h for an 4-6 kg cat. The cat is rechecked in about 5-10 days and at about 12 hours after the last dose of insulin; fasting is not needed unless a PLI is performed. The results of that reading are combined with the clinical signs (PU/PD/PP/WL) to determine the appropriate dose. The goal at 12 hours post insulin is for the glucose to be 300-400 mg/dl. Values slightly above that range are acceptable if the clinical signs are controlled following the principle: “It is better to under-dose than over-dose.” It generally takes 2-4 weekly rechecks to achieve regulation. An ultra-low carbohydrate diet, preferably canned, is strongly recommended.

Once regulated, cats are seen about every 4-6 weeks for a single glucose check, performed about 12 hours after the last injection of insulin (the high point of the day). The results of that reading are combined with the clinical signs (PU/PD/PP/WL) to determine the appropriate dose. The goal at 12 hours post insulin is for the glucose to be 300-400 mg/dl. Values slightly above that range are acceptable if the clinical signs are controlled. After doing this for a while (many years in my case) one will develop an appreciation of how well cats tolerate reasonable hyperglycemia without adverse effects and how well clients comply. Because this approach is less burdensome to the client than other approaches, most will treat their cats on a long-term basis.

Note that I do not use glucose curves or home glucose testing in my regulation protocol. Glucose curves are notoriously inaccurate and misleading in cats and should be used sparingly, if at all. Home glucose testing places undue emphasis on glucose values instead of the whole cat. It also often results in clients making dosing decisions and excluding professional involvement.

**Low Carb, High Protein Fancy Feast Canned Products
Dry Matter Basis, Revised February 2014**

	<u>Protein</u>	<u>Carbohydrates</u>
<u>Fancy Feast CLASSIC Varieties</u>		
Tender Beef Feast	53%	4.4%
Tender Beef & Chicken Feast	51%	3.7%
Tender Beef & Liver Feast	51%	4.7%
Tender Liver & Chicken Feast	55%	3.0%
Turkey & Giblets Feast	53%	3.9%
Chopped Grill Feast	53%	4.4%
Cod, Sole & Shrimp Feast	61%	0.0%
Chicken Feast	53%	3.8%
Salmon & Shrimp Feast	53%	4.9%
Seafood Feast	57%	2.6%
Ocean Whitefish & Tuna Feast	60%	2.1%
Savory Salmon Feast	52%	4.7%
<u>Fancy Feast FLAKED Varieties</u>		
Chicken & Tuna Feast	62%	5.6%
Fish & Shrimp Feast	63%	0.0%
Salmon & Ocean Whitefish Feast	61%	5.4%
Trout Feast	61%	4.7%
Tuna Feast	62%	6.5%
Tuna & Mackerel Feast	65%	6.8%
<u>Fancy Feast CHUNKY Varieties</u>		
Chicken Feast	57%	4.8%
Turkey Feast	56%	5.6%
Chopped Grilled Feast	55%	5.8%
<u>Fancy Feast DELIGHTS WITH CHEDDAR Varieties</u>		
Classic Salmon & Cheddar Cheese Feast	51%	3.9%
Classic Turkey & Cheddar Cheese Feast	49%	5.5%

To download:

<https://dl.dropboxusercontent.com/u/69563616/Fancy%20Feast%20CHO%20DM.doc>

