



Estimated Energy Requirements

Resting Energy Requirements

Canine

Growth DER (kcal/day)

Up to four months = 3 × RER
Four months and older = 2 × RER

Maintenance DER (kcal/day)

Average, neutered adult = 1.6 × RER
Intact adult = 1.8 × RER
Obese prone = 1.4 × RER
Weight loss = 1.0 × RER

Work DER (kcal/day)

Light work = 2 × RER
Moderate work = 3 × RER
Heavy work = 4-8 × RER

RER - Resting Energy Requirement represents the energy requirement for a normal animal at rest in a thermoneutral environment, and is based on body weight.

DER - Daily Energy Requirement represents the average daily energy expenditure of an animal, dependent on lifestage and activity (work, gestation, lactation and growth).

RER (kcal/day) = 70 × wt _{kg} ^{0.75}		
lbs	kg	RER (kcal/day)
1	0.5	39
2	0.9	65
3	1.4	88
4	1.8	110
5	2.3	130
6	2.7	149
7	3.2	167
8	3.6	184
9	4.1	201
10	4.5	218
11	5.0	234
12	5.5	250
13	5.9	265
14	6.4	280
15	6.8	295
16	7.3	310
17	7.7	324
18	8.2	339
19	8.6	353
20	9.1	366
25	11.4	433
30	13.6	497
35	15.9	558
40	18.2	616
45	20.5	673
50	22.7	729
55	25.0	783
60	27.3	835
65	29.5	887
70	31.8	938
75	34.1	988
80	36.4	1037
85	38.6	1085
90	40.9	1132
95	43.2	1179
100	45.5	1225
105	47.7	1271
110	50.0	1316
115	52.3	1361
120	54.5	1405
125	56.8	1449
130	59.1	1492
135	61.4	1535
140	63.6	1577
145	65.9	1619
150	68.2	1661
155	70.5	1702
160	72.7	1743
165	75.0	1784
170	77.3	1824
175	79.5	1864
180	81.8	1904
185	84.1	1944
190	86.4	1983
195	88.6	2022
200	90.9	2061

4 Follow up consistently for best results

weight loss rate	Goal 0.5 – 2% BW per week ¹
pain control assesment ²	Adjust after 2 – 4 weeks ¹
modify exercise plan	Increase intensity if well-tolerated

5 Consider further treatment



Rehabilitation

Hydrotherapy, individualized exercise plan, referral to a canine rehab^{4,5,6}



Supplements

Omega-3, undenatured type II collagen (supplemented by Hill's j/d or Metabolic + Mobility)



Analgesic modalities

Laser therapy, electromagnetic field therapy, acupuncture, etc.



Intra-articular injectates

Hyaluronan, corticosteroids, tin-117m, platelet biologics

¹Brooks D, Churchill J, Fein K, et al. 2014 AAHA weight management guidelines for dogs and cats. J Am Anim Hosp Assoc. 2014;50(1):1-11. doi:10.5326/JAAHA-MS-6331 ²Deabold K, Montalbano C, Miscioscia E. Feline Osteoarthritis Management. Vet Clin North Am Small Anim Pract. 2023;53(4):879-896. doi:10.1016/j.cvsm.2023.02.015 ³Su DK, Murphy M, Hand A, Zhu X, Witzel-Rollins A. Impact of feeding method on overall activity of indoor, client-owned dogs. J Small Anim Pract. 2019;60(7):438-443. doi:10.1111/jsap.13003 ⁴Ratsch BE, Levine D, Wakshlag JJ. Clinical Guide to Obesity and Nonherbal Nutraceuticals in Canine Orthopedic Conditions. Vet Clin North Am Small Anim Pract. 2022;52(4):939-958. doi:10.1016/j.cvsm.2022.03.002 ⁵Gamble LJ. Physical Rehabilitation for Small Animals. Vet Clin North Am Small Anim Pract. 2022;52(4):997-1019. doi:10.1016/j.cvsm.2022.03.005 ⁶Lotsikas PJ. Intra-articular Injectates: What to Use and Why. Vet Clin North Am Small Anim Pract. 2022;52(4):967-975. doi:10.1016/j.cvsm.2022.03.004



steps to manage osteoarthritis and obesity

A multimodal approach to your patient's osteoarthritis and weight treatment plan provides comprehensive care, helping to manage your patient's condition so they can enjoy life to the fullest.

Developed in conjunction with Erin Miscioscia, DVM, DACVSMR, CVA; Clinical Assistant Professor and Service Chief, Integrative and Mobility Medicine; Department of Comparative, Diagnostic & Population Medicine; College of Veterinary Medicine, University of Florida

1 Assess



history

- › **Diet:** caloric density, protein content, form, frequency, treats
- › **Activity:** general activity level and targeted exercise
- › **Analgesic Plan:** medications
- › **Adjunct Therapies:** supplements, other nutraceuticals



client

- › Flexibility in adjusting diet (type, cost, frequency) and exercise plan
- › Environmental factors: yard, stairs, boarding
- › Feeding habits: frequency, number of people involved in feeding



physical exam

- › Pain, lameness and/or osteoarthritis score
- › Muscle condition score (MCS)
- › Body weight (BW)
- › Body condition score (BCS)
- › Body Fat Index (BFI)

2 Calculate¹



- › Current calorie intake: from primary diet, treats and supplements



- › Ideal BW: to calculate, use Hill's Body Fat Index tool



- › Goal calories for weight loss:
 - 80% of daily calories OR
 - Resting Energy Requirement for ideal BW

Current Weight	IDEAL BODY WEIGHT [LB]					
	Body Fat % 20	Body Fat % 30	Body Fat % 40	Body Fat % 50	Body Fat % 60	Body Fat % 70
10	10	8.8	7.5	6.3	5.0	3.8
11	11	9.6	8.3	6.9	5.5	4.1
12	12	10.5	9.0	7.5	6.0	4.5
13	13	11.4	9.8	8.1	6.5	4.9
14	14	12.3	10.5	8.8	7.0	5.3
15	15	13.1	11.3	9.4	7.5	5.6
20	20	17.5	15.0	12.5	10.0	7.5
25	25	21.9	18.8	15.6	12.5	9.4
30	30	26.3	22.5	18.8	15.0	11.3
35	35	30.6	26.3	21.9	17.5	13.1
40	40	35.0	30.0	25.0	20.0	15.0
45	45	39.4	33.8	28.1	22.5	16.9
50	50	43.8	37.5	31.3	25.0	18.8
55	55	48.1	41.3	34.4	27.5	20.6
60	60	52.5	45.0	37.5	30.0	22.5
65	65	56.9	48.8	40.6	32.5	24.4
70	70	61.3	52.5	43.8	35.0	26.3
75	75	65.6	56.3	46.9	37.5	28.1
80	80	70.0	60.0	50.0	40.0	30.0
85	85	74.4	63.8	53.1	42.5	31.9
90	90	78.8	67.5	56.3	45.0	33.8
95	95	83.1	71.3	59.4	47.5	35.6
100	100	87.5	75.0	62.5	50.0	37.5
105	105	91.9	78.8	65.6	52.5	39.4
110	110	96.3	82.5	68.8	55.0	41.3
115	115	100.6	86.3	71.9	57.5	43.1
120	120	105.0	90.0	75.0	60.0	45.0
130	130	113.8	97.5	81.3	65.0	48.8
140	140	122.5	105.0	87.5	70.0	52.5
150	150	131.3	112.5	93.8	75.0	56.3
160	160	140.0	120.0	100.0	80.0	60.0

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3 Implement

diet plan^{1,2}

For overweight pets:

- › Most OTC pet foods are not appropriately designed for weight loss
 - › Just decreasing food consumption is generally ineffective
 - › Nutrient profile not optimized for weight loss and may include high fats
 - › High in calories so the pet is often hungry and unsatisfied
 - › May put the pet at risk for nutrient deficiencies
- › Instead, feed nutrition specifically designed for weight loss, low in caloric density with high protein, fiber and omega-3s
 - » 7.9g / 100 kcal protein or >2.5g protein / kg ideal BW per day

Recommendation:

Hill's Prescription Diet Metabolic + Mobility

- › 88% of pets lost weight at home in 2 months when fed the nutrition of Metabolic + Mobility
- › Clinically proven nutrition to help dogs naturally lose weight by activating their metabolism and improve mobility in as little as 21 days
- › How it works:
 - » Activates pet's metabolism for easy and effective weight loss
 - » Enriched with omega-3 fatty acids, and contains glucosamine & chondroitin sulfate
 - » Stimulates dog's natural ability to burn fat

Did you know?

Hill's Prescription Diet Metabolic + Mobility Dry Dog Food is specially formulated by nutritionists & veterinarians to help with weight loss and maintenance and joint health.



Reducing weight by just 6 – 10% may alleviate arthritic signs in dogs⁴

exercise plan^{2,3,4} (if appropriate for pet):

- › Short walks, hydrotherapy, puzzle feeders, play

Targeted exercise examples:



forelimb

Decline walk, crawl, shake/swat



hindlimb

Incline walk, paws-up, dancing



core strength

3-legged stand, weaves



3 Implement (continued)

analgesic plan²

- › Analgesic starting plan recommended by AAHA for chronic canine pain is NSAID or antiNGF/mAb

Recommended first tier osteoarthritis therapies

