Neutralisation og metabolisme

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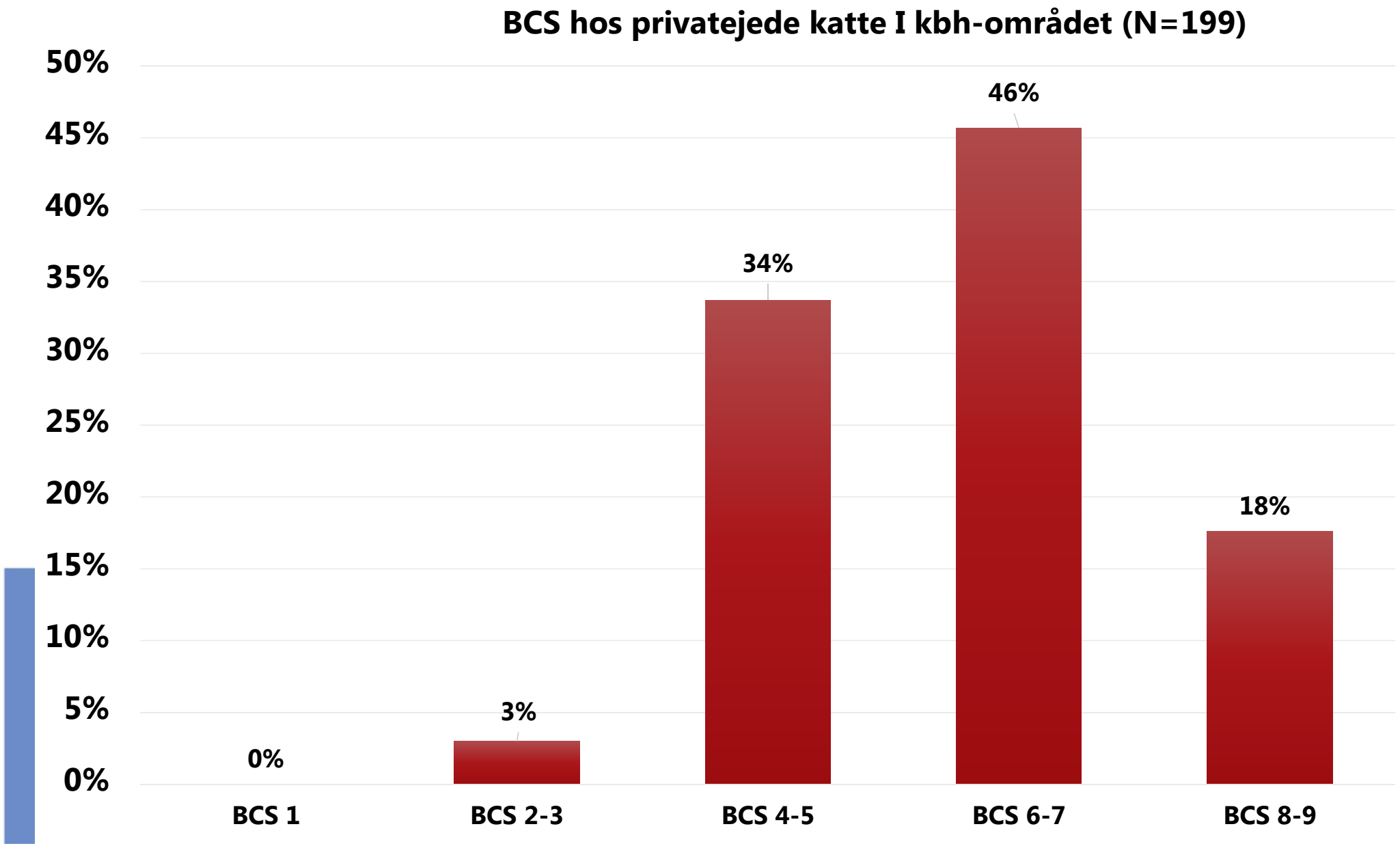
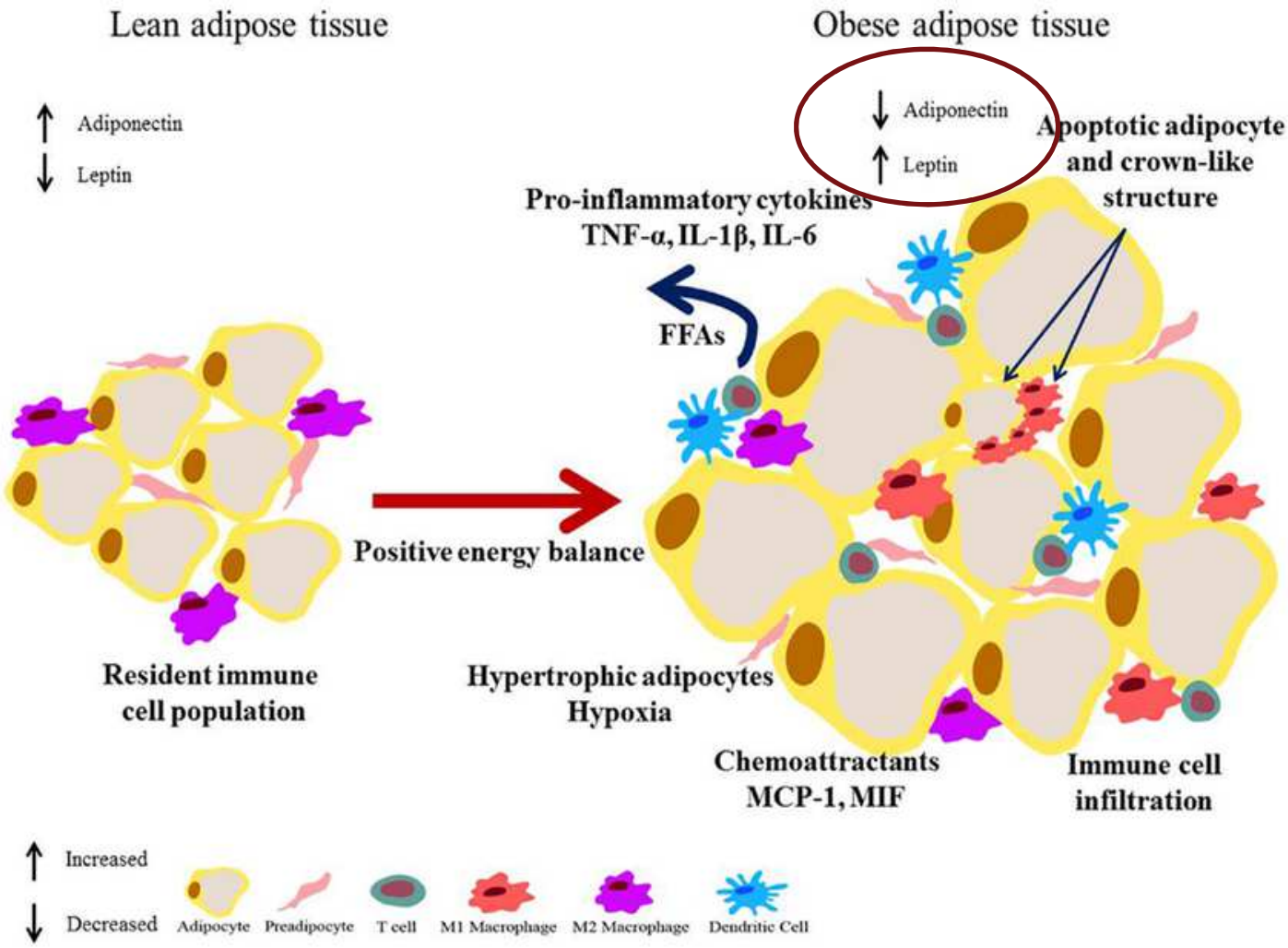
BCS hos privatejede hunde præsenteret hos dyrlægen i 2017 (N=268)


BCS hos privatejede katte I kbh-området (N=199)
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
0%
3%
34%
46%
18%
BCS 1
BCS 2-3
BCS 4-5
BCS 6-7
BCS 8-9

Overvægt resulterer i inflammation og insulin resistens



Overvægt øger risiko for mange forskellige lidelser hos mennesker

Region Sjælland

Overvægt hos kat er korreleret med flere sygdomme

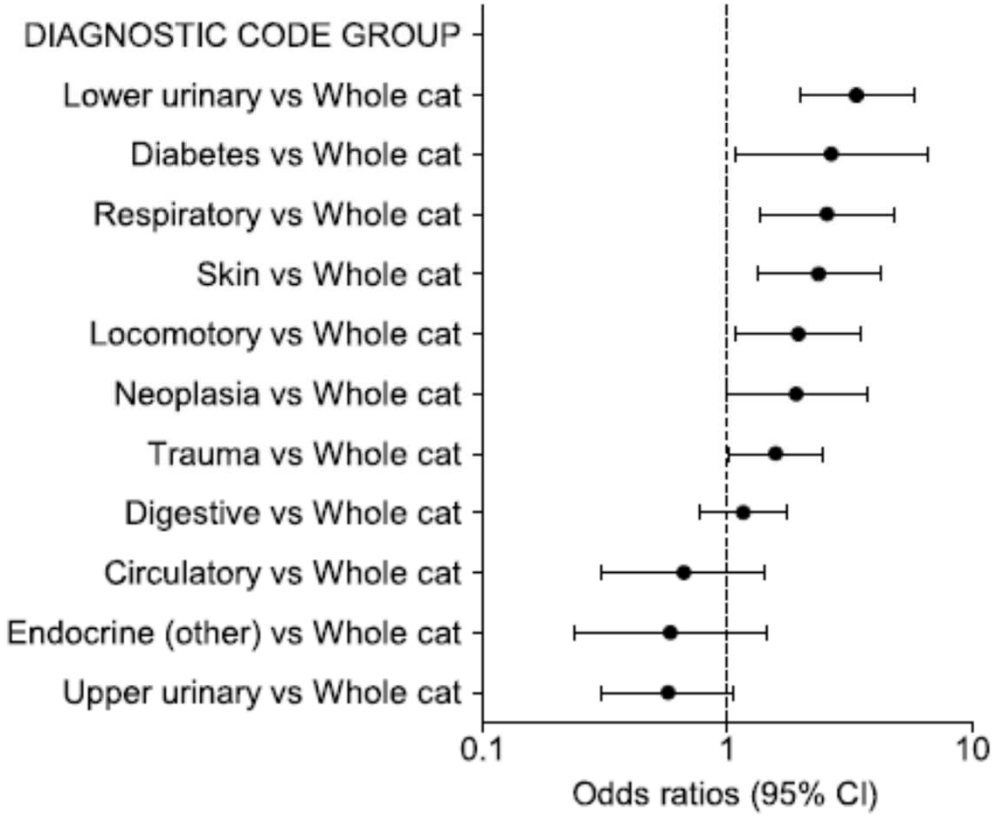
Öhlund *et al. Acta Vet Scand (2018) 60:5*
https://doi.org/10.1186/s13028-018-0359-7

Acta Veterinaria Scandinavica

RESEARCH Open Access

Overweight in adult cats: a cross-sectional study

Malin Öhlund[1*], Malin Palmgren[2] and Bodil Ström Holst[1]



Overvægt prædisponerer for sygdom hos hund og kat

Kat:

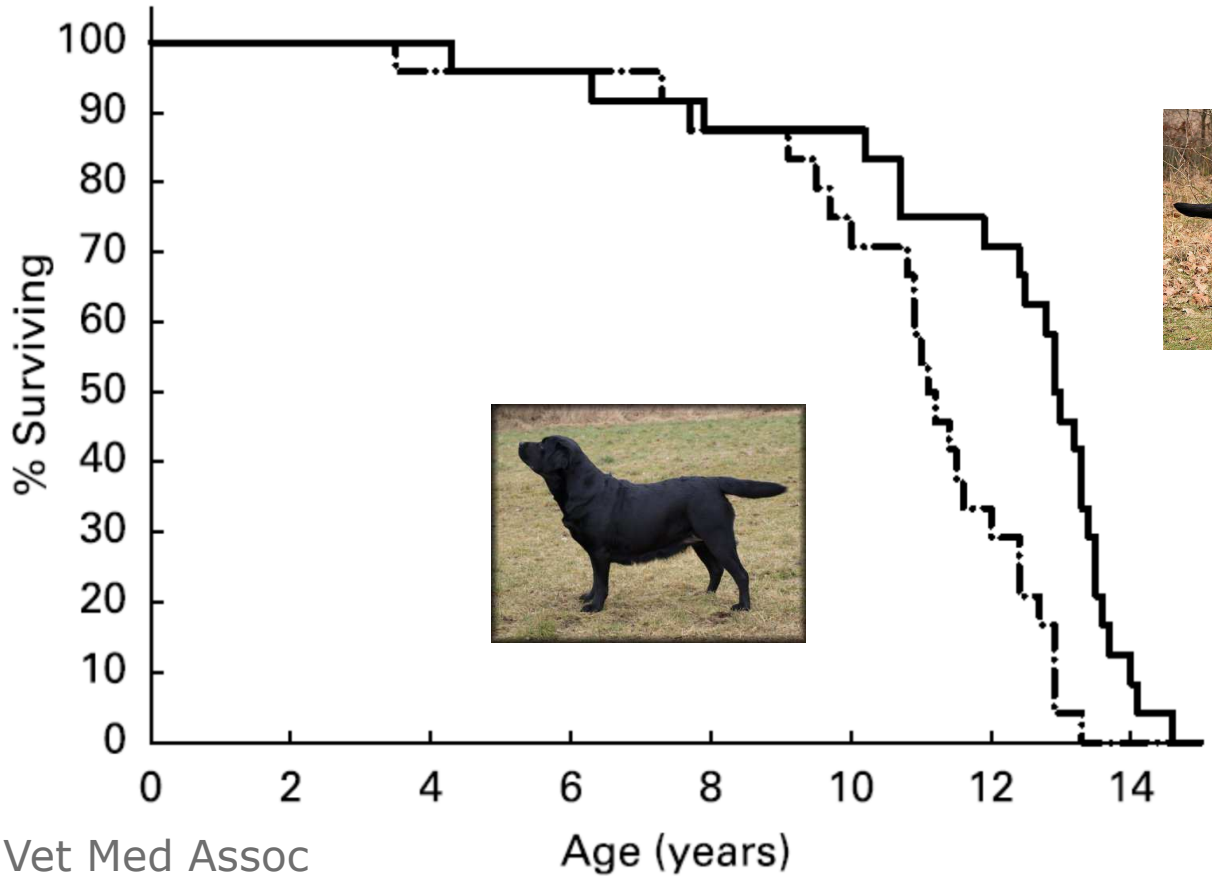
- **Nedre urinvejslidelser**
- **Insulinresistens**
- **Sukkersyge**
- **Ledproblemer**
- **respirationsproblemer**
- **Fedtlever**
- **Dyslipidæmi**
- **Øget anæstesi-risiko**
- **Nedsat evne til at soignere sig**
- **Evt. nogle cancerformer**

Hund:

- **insulinresistens**
- **Osteoarthritis**
- **Respirationsproblemer**
- **Dyslipidæmi**
- **Bugspytkirtelbetændelse**
- **Øget anæstesi-risiko**
- **Evt nogle cancerformer**
- **Nedsat levetid (1-2 år)**

AJ German, 2006, Öhlund M 2018

Overvægt nedsætter levetiden for hund



Kealy et al 2002, J Am Vet Med Assoc

Ledsmerter, inaktivitet og overvægt

Prædisponerende faktorer hos hund

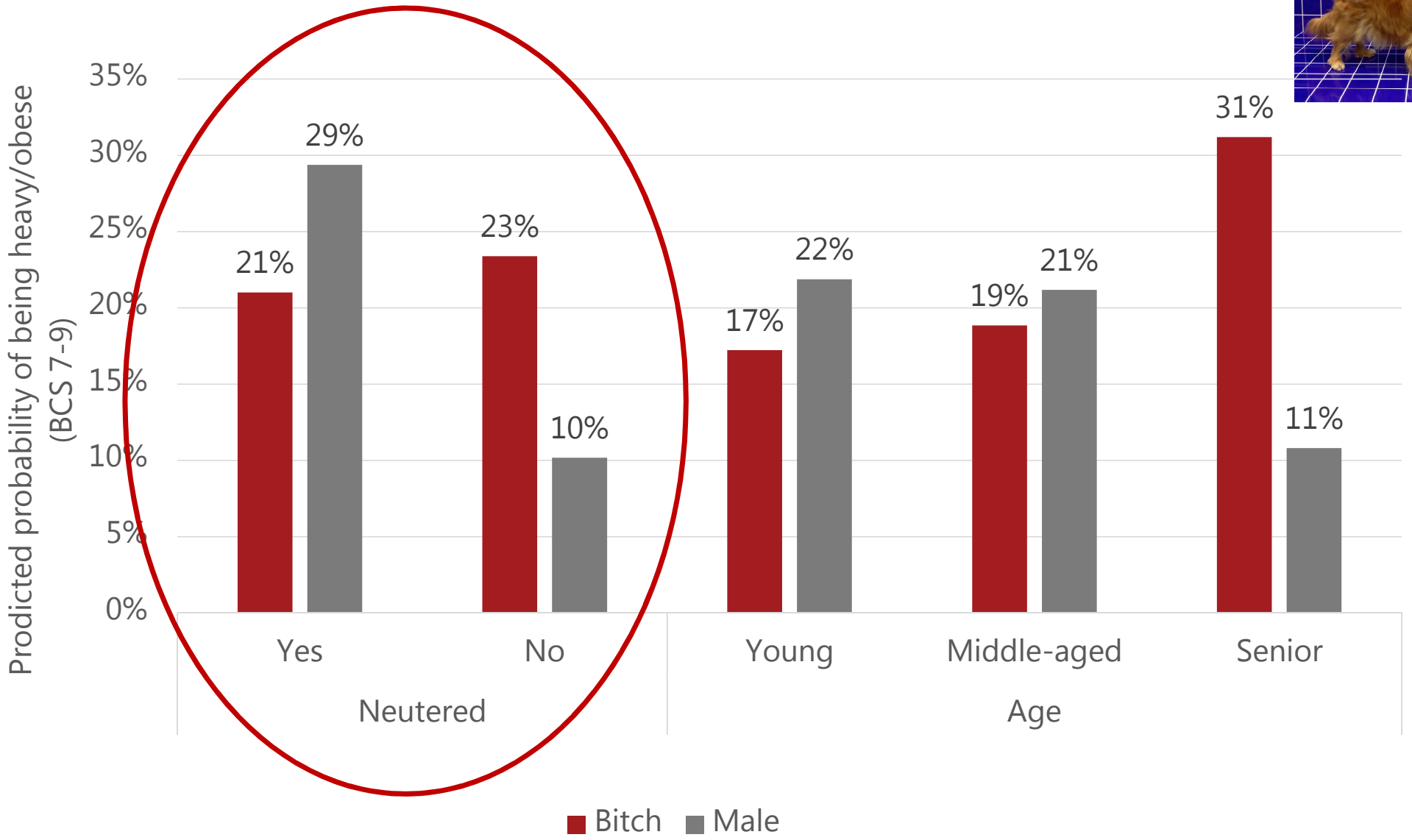
Faktorer relaterende til hundens karakteristika:

- Hunkøn
- **Kastrering**
- Stigende alder
- race
- appetit

Fodrings og ejer relaterede faktorer:

- Fodrings interval
- Godbidder
- Ejers BMI
- Aktivitets niveau
- Ejers alder/pensioneret ejer
- Ejers tilknytning til hund
- Lav indkomst
- Rester/hjemmelavet mad

McGreevy 2005, Colliard 2006, Nijland 2009, Bland 2009, Sallander 2010, Bjørnvad et al. unpublished


Predicted probability of being heavy/obese (BCS 7-9)
35%
30%
25%
20%
15%
10%
5%
0%
21%
29%
23%
10%
17%
22%
19%
21%
31%
11%
Yes
No
Neutered
Young
Middle-aged
Senior
Age
Bitch
Male

Prædisponerende faktorer hos kat

Faktorer relaterende til kattens karakteristika:

- Hankøn
- Indendørskat
- **Sterilisering/kastrering**
- Alder (>2 years, <9 years)

Fodring og ejer relaterede faktorer :

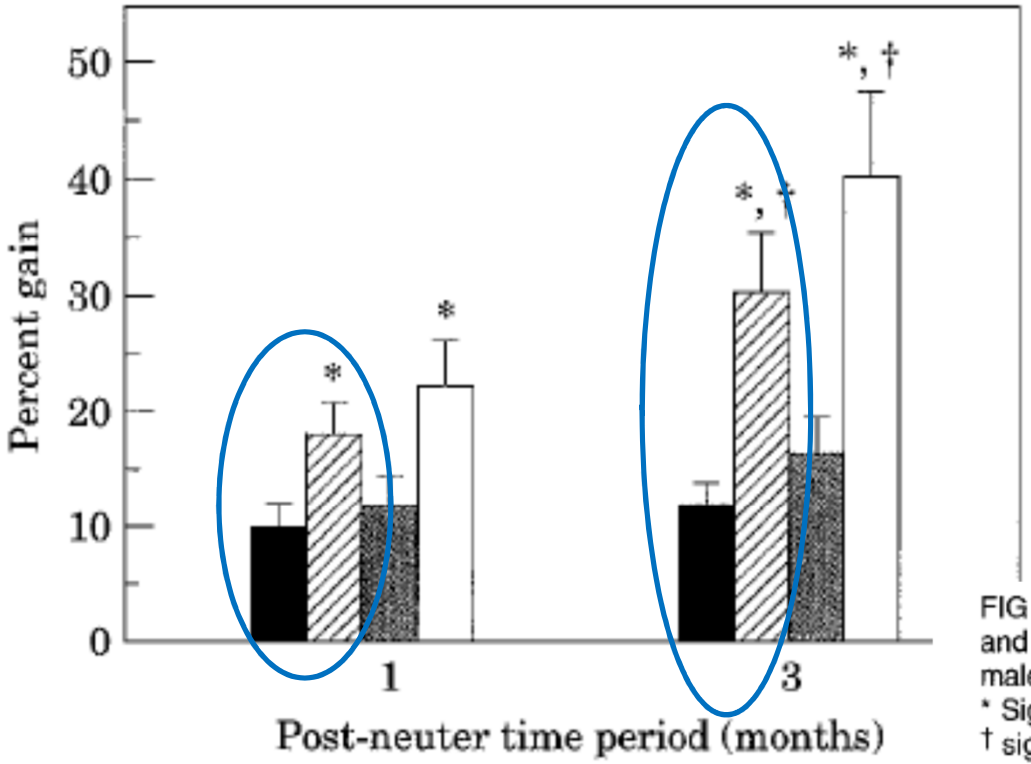
- Ejers tilknytning til katten
- Fodrings interval
- Midaldrende ejer

Colliard et al. , Courcier 2010, Slingerland et al. 2007, Bjørnvad & Sandøe et al. unpublished

*Research in Veterinary Science 1997, **62**, 131-136*

Effects of neutering on bodyweight, metabolic rate and glucose tolerance of domestic cats

M. J. FETTMAN, C. A. STANTON, L. L. BANKS, D. W. HAMAR, *Department of Pathology,*
D. E. JOHNSON, *Department of Animal Sciences, Colorado State University, Fort Collins, CO 80523-1671, USA,*
R. L. HEGSTAD, S. JOHNSTON, *Department of Clinical and Population Sciences, University of Minnesota, St Paul MN55108, USA*



12 hankatte
11 hunkatte

18-24 mdr. gamle

FIG 2: Mean (SEM) percentage weight gain in four groups of cats one and three months after they were neutered or left intact (■ = sexually intact male, ▩ = neutered male, ■ = sexually intact female, □ = spayed female). * Significantly different from sexually intact groups of same gender ($P<0.05$), † significantly different from one month after neutering ($P<0.05$)

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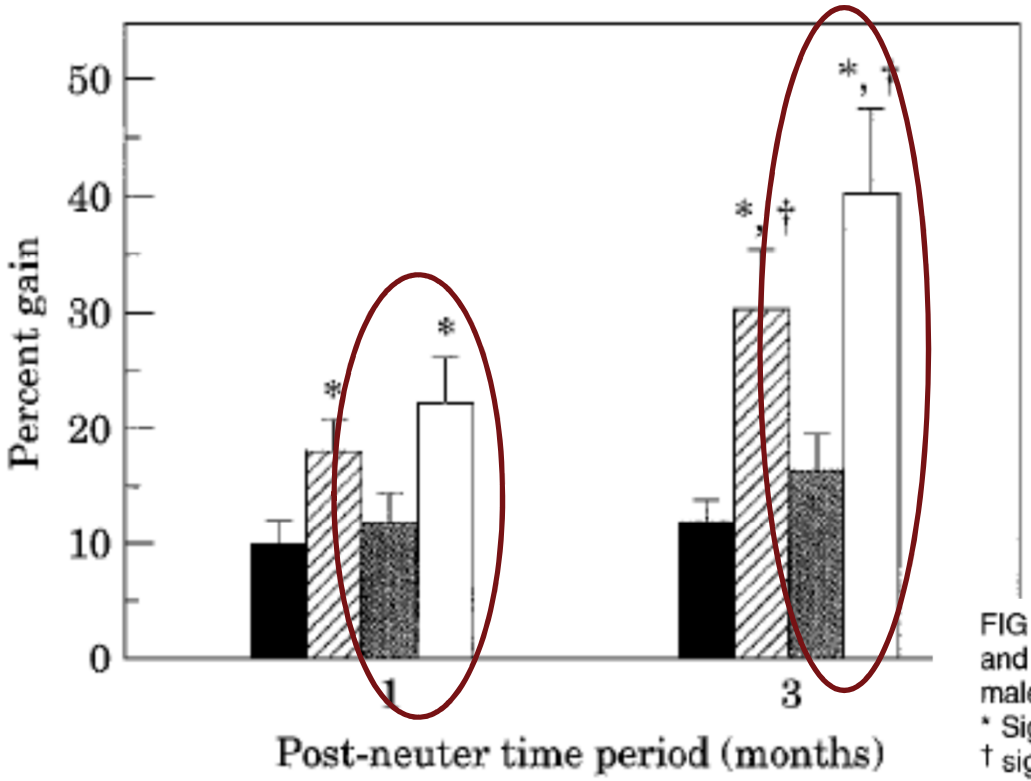

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Appetitten øges hos neutraliserede katte

TABLE 1: Mean (SEM) bodyweight and food intake of four groups of cats before and after they were neutered or left intact (M = sexually intact male, NM = neutered male, F = sexually intact female, SF = spayed female)

	Before neutering	1 month after neutering	3 months after neutering
Bodyweight (kg)			
M	5·20 (0·70)	5·73 (0·76)*	5·82 (0·81)*
NM	4·63 (0·39)	5·43 (0·37)*	5·97 (0·42)*,†
F	2·94 (0·19)[a]	3·31 (0·25)*,[a]	3·41 (0·23)*,[a]
SF	2·59 (0·13)[b]	3·15 (0·11)*,[b]	3·60 (0·15)*,†,[b]
Food intake (g/day)			
M	57·8 (5·4)	ND	55·3 (5·7)
NM	57·7 (5·7)	ND	72·8 (4·4)*,[a]
F	53·1 (5·3)	ND	53·8 (4·8)
SF	44·3 (3·3)	ND	52·0 (3·9)*,[b]

*Research in Veterinary Science 1997, **62**, 131-136*

Neutralisering reducerer ikke basalmetabolismen hos hankat

TABLE 2: Mean (SEM) resting metabolic rate and fasting metabolic rate of four groups of cats before and after they were neutered or left intact (M = sexually intact male, NM = neutered male, F = sexually intact female, SF = spayed female)

	Before neutering	1 month after neutering	3 months after neutering
Resting metabolic rate (kcal kg bodyweight$^{-0.75}$ day^{-1})			
M	85·3 (3·9)	70·0 (3·4)*	67·2 (2·2)*
NM	84·5 (3·4)	74·6 (3·9)	67·5 (2·4)*
F	95·3 (4·7)	85·9 (4·5)*,a	83·2 (3·6)*,a
SF	86·1 (5·9)	78·1 (2·2)	80·1 (3·0)b

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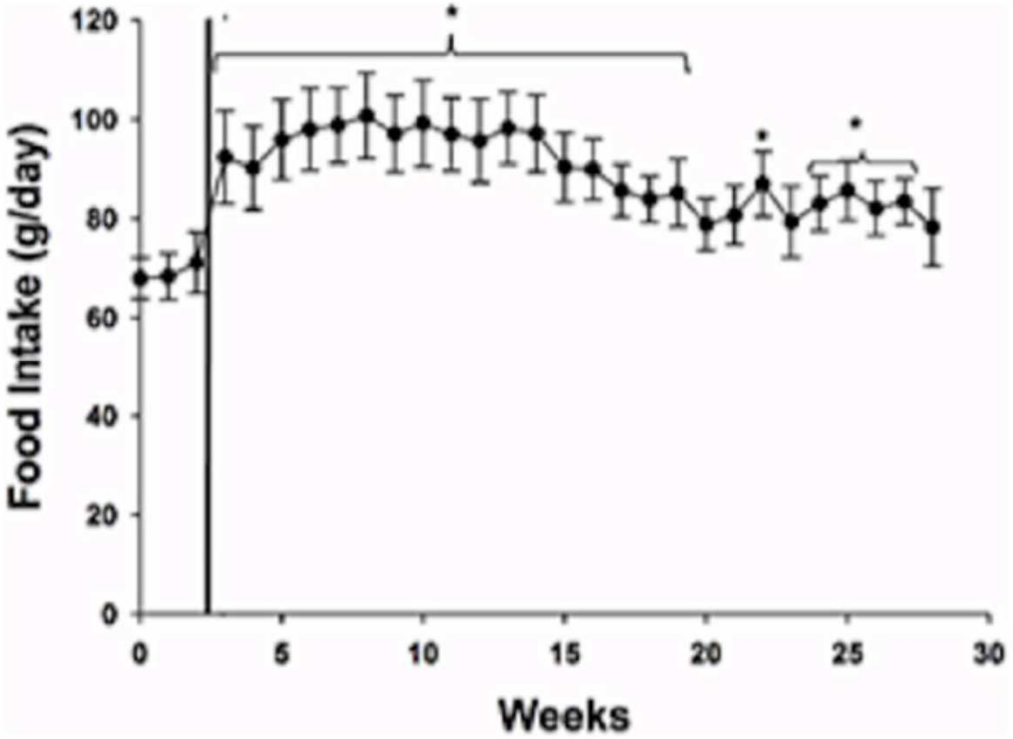
PLOS ONE

Early Effects of Neutering on Energy Expenditure in Adult Male Cats

Alfreda Wei[1]*, Andrea J. Fascetti[1], Kyoungmi Kim[2], Ada Lee[1], James L. Graham[1,3], Peter J. Havel[1,3], Jon J. Ramsey[1]

N=9, gns. alder 2,8 år



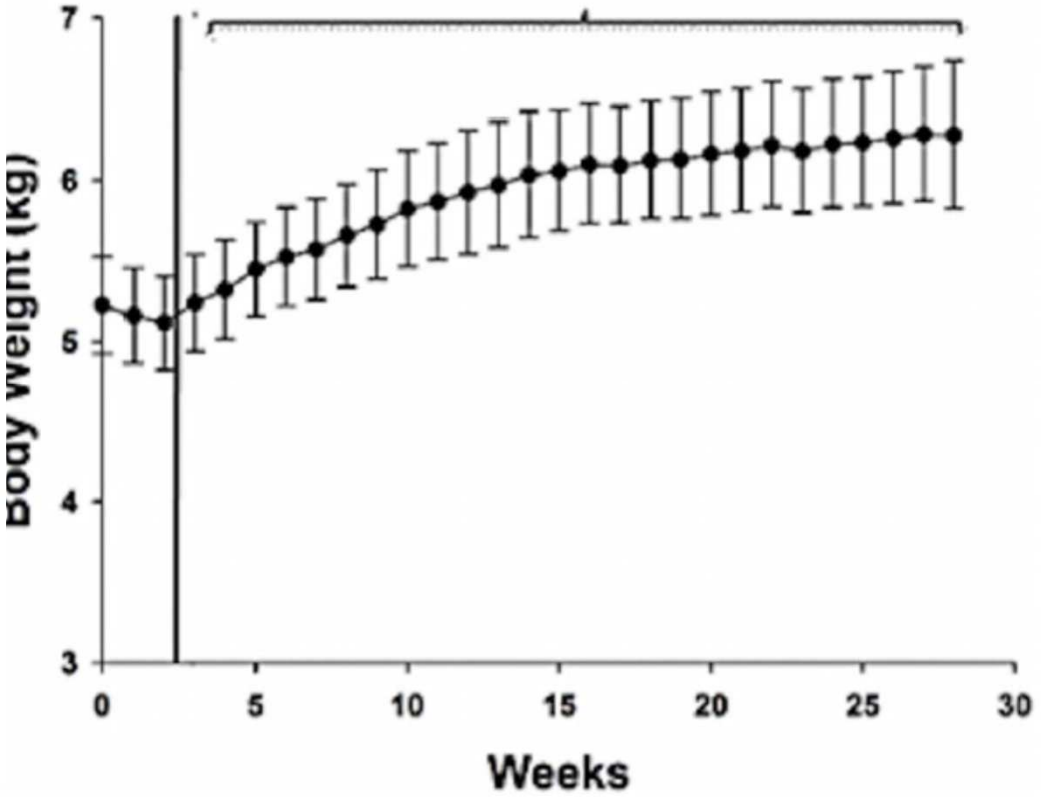


Table 3. Serum chemistry results determined in cats at pre-neutering, 7 days post-neutering, 13-days post-neutering, and 6 months post-neutering.*

Estradiol supplement reducerer appetitten hos både han- og hunkatte der er neutraliseret

	Pre-neutering	Post-neutering (day 7)	Post-neutering (day 13)	Post-neutering (6 months)
Serum chemistry				
Glucose (mg/dL)	89.1±9.5^{a}	77.3±3.6^{a,b}	80.1±6.9^{a,b}	72.0±3.4^{b}
Insulin (μU/mL)	10.7±1.3	10.6±1.7	10.8±1.5	12.0±2.3
Leptin (ng/mL)	3.9±0.3^{a,b}	3.6±0.3^{a}	4.0±0.3^{b}	6.3±1.0^{c}
Free fatty acids (mEq/L)	0.36±0.06	0.37±0.06	0.35±0.04	0.38±0.05
Triglycerides (mg/dL)	32.7±6.3^{a,c}	26.1±5.0^{a,b}	24.4±3.7^{b}	42.8±5.8^{c}
Ghrelin (pg/mL)	727.3±54.2^{a}	788.8±60.3^{b,c}	767.1±35.8^{a,b}	855.35±42.4^{c}
Adiponectin (μg/mL)	7.8±1.3^{a}	5.1±0.9^{b}	5.2±0.7^{b}	2.6±0.7^{c}

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PLOS ONE

Energy Requirements of Adult Dogs: A Meta-Analysis

Emma N. Bermingham[1], David G. Thomas[2,3], Nicholas J. Cave[3], Penelope J. Morris[4], Richard F. Butterwick[4], Alexander J. German[5]*

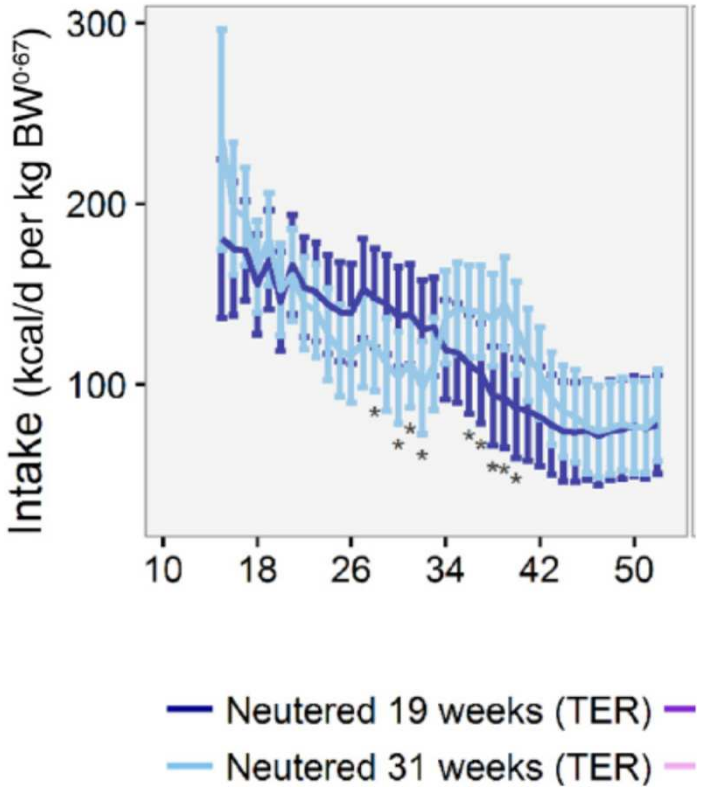
Data fra 29 publikationer

- **Neutraliserede hunde har lavere energibehov end intakte (p< 0.001)**
- **Energibehov:**
  - neutraliseret; 146,4 ± 21,5 kcal/kg^{0,75}
  - intakt; 195,7 ± 23,4 kcal/kg^{0,75}
- **Ingen kønsforskel**
- **Dog ikke muligt at analysere intakt versus neutraliseret ifht køn**

Effekt af alder ved neutralisering: hund og kat

Risiko for udvikling af overvægt:

- **Umiddelbart ingen effekt af alder ved neutralisering hos hund[1]**
- **Muligvis reduceret risiko ved tidlig neutralisering (19 uger) for hunkat[2]**



[1]Lefebvre SL et al. Effect of age at gonadectomy on the probability of dogs becoming overweight. *J Am Vet Med Assoc*. 2013;243:236–243
[2]Allaway et al. The impact of time of neutering on weight gain and food intake in female kittens. *Journal of Nutritional Sciences* 2017 6:1-4

Diabetes Mellitus – incidens

Incidens:

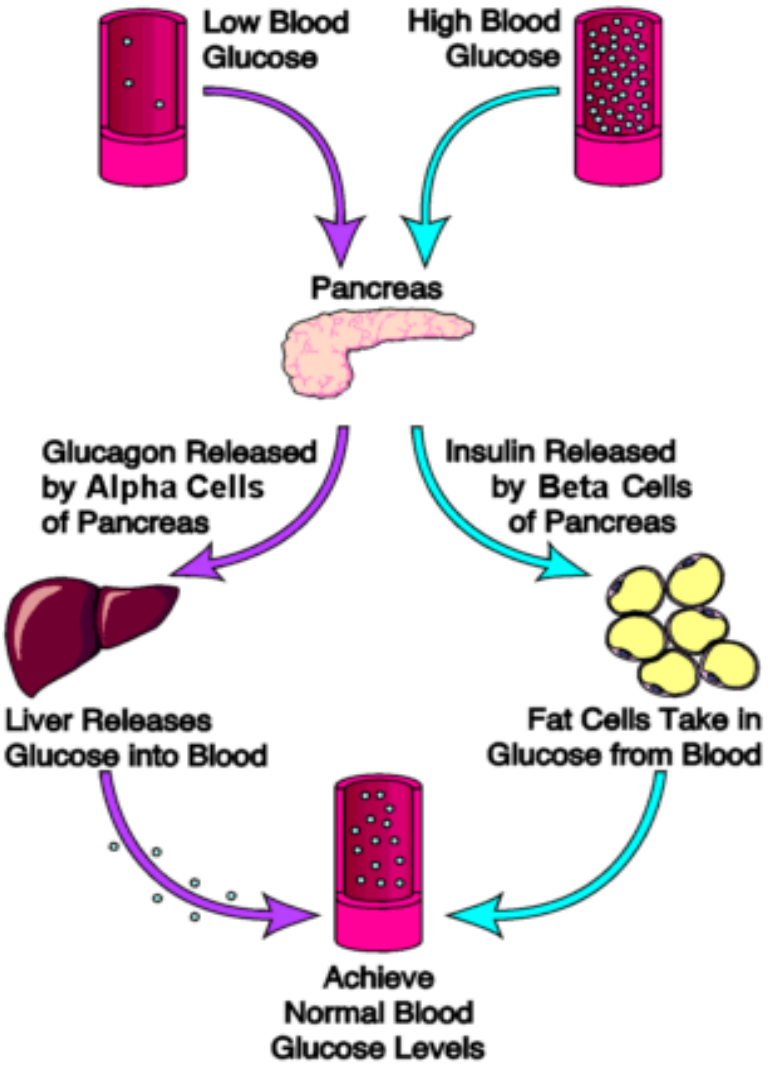
- Mennesker: 6-15%

- Hund: 1,2% (0,32 – 1,33%)

(70% intakte hunhunde)

- Kat: 0,5% (0,25 – 4%)

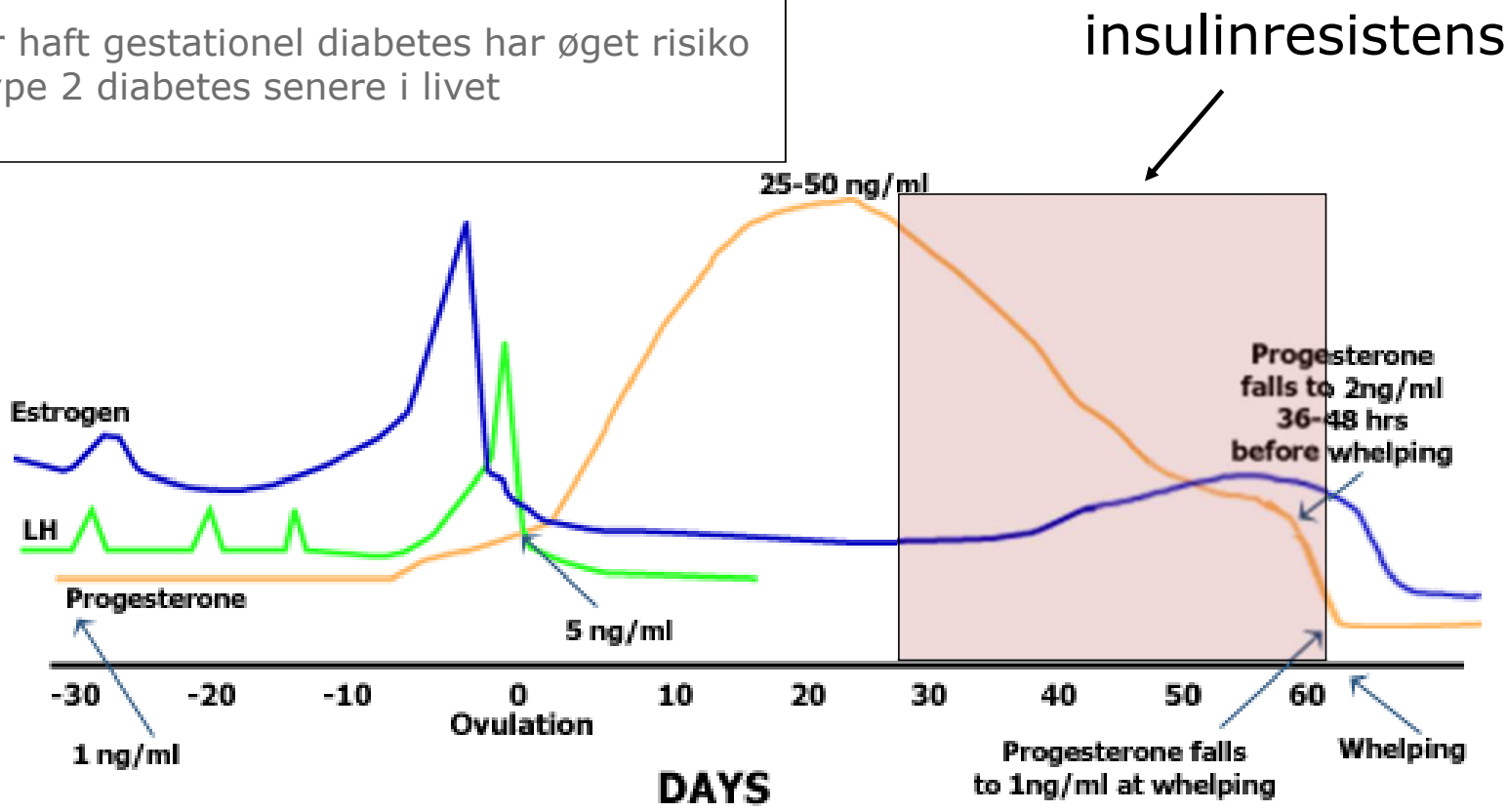
(kastrerede hankatte overrepræsenteret)



DM hos hund: Diøstrus/gestationel DM

-Koblet til insulinresistens sfa. stigende cirkulerende progesteron og væksthormon og evt. nedsat evne til insulin produktion

- Hunde der har haft gestationel diabetes har øget risiko for at udvikle type 2 diabetes senere i livet



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Tak for opmærsomheden ☺