

MANAGING NUTRITION AND ACTIVITY IN NEUTERED COMPANION ANIMALS

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TIM WATSON looks at the benefits and risks of neutering cats and dogs, and how best to prevent subsequent problems with obesity and disease development

Summary

Neutering dogs and cats is essential to control unwanted pregnancies and avoidance of antisocial behaviours such as marking and inappropriate elimination, wandering and aggression. Neutering also reduces the likelihood of mammary tumours and eliminates risk of ovarian and uterine cancers, as well as pyometra and other infections of the female reproductive tract. Castration and spaying can, however, lead to health issues, most notably obesity and an increased risk of diabetes mellitus in cats. Other untoward consequences can include urinary tract problems (incontinence, lower urinary tract diseases) and hormonally related skin conditions, such as cutaneous mast cell tumours. Relationships between neutering, physical activity and development of obesity are complex. Research indicates it is a combination of reduced activity and failure to control calorie consumption that leads to an imbalance between energy intake and expenditure and accumulation of body fat. In cats, this, in turn, leads to worsening of insulin resistance and development of diabetes mellitus. Lifestyle and diet of neutered dogs and cats should be managed carefully to maintain activity levels after neutering and to control calorie consumption. Principles of obesity management are directly applicable in this regard and diets specifically tailored for neutered pets can help in preventing weight gain.

Key words

dog, cat, neuter, spay, castrate, obesity, diabetes mellitus

NEUTERING dogs and cats is essential for the control of unwanted litters and avoidance of antisocial, sexually motivated behaviours – such as marking, inappropriate urination or defaecation, wandering and aggression.

Spaying reduces the likelihood of mammary tumours and, when performed in dogs with established breast cancer, increases survival. Neutering also eliminates risk of ovarian and uterine cancers, as well as pyometra and other infections of the female reproductive tract.

But neutering is not without consequences on health and is a prominent risk factor for obesity in dogs and cats, as well as diabetes mellitus in cats. In addition, there are concerns that spaying bitches, especially before their first oestrus, can result in urinary incontinence, as well as increasing the risk of lower urinary tract diseases and certain skin tumours in dogs.

The role neutering plays in the development of obesity and diabetes mellitus is complex, with diet and activity playing interrelated roles. Clearer understanding of these relationships is evolving, bringing potential to intervene and prevent weight gain and diabetes, and is examined in this article. The risks of incontinence and skin tumours are also discussed.

Why do neutered dogs and cats become fat?

Neutered dogs and bitches are more than twice as likely to be obese as sexually intact animals, and neutered male and female cats are at similarly greater risk of obesity. For a long time it was believed this was due to a reduction in metabolic rate after neutering, such that fewer food calories were burned as energy and a greater number diverted to body fat stores.

More recent evidence has indicated that when metabolic rate is expressed on a lean body mass basis – rather than per total bodyweight – there is no difference between neutered and sexually intact individuals (German, 2006). This is important because fat stores, which make up the difference between total and lean body masses, are metabolically inactive and including them in the calculation of overall metabolic rate will give erroneously lower rates in fatter animals.

Thus, instead of affecting metabolic rate, it is likely neutering leads to obesity through reduction in energy requirement – largely as a consequence of reduced physical activity – changes in feeding behaviour and food consumption. The net result is that calorie intake exceeds energy expenditure, leading to weight gain.

A review of 42 papers published on maintenance energy requirements of cats found, on average, neutered individuals of both sexes required 10 per cent fewer calories than sexually intact cats (Bermingham et al, 2010). Studies in kennelled female cats have shown maintenance energy requirements are reduced by around 25 per cent after spaying (Alexander et al, 2011).

Activity levels have a substantial impact on energy expenditure with, for example, daily calorie requirements for an active 20kg border collie dog declining from 175 kcal/kg^{0.75} to 97 kcal/kg^{0.75} when it adopts a more sedentary lifestyle. If this occurs without an equivalent reduction in food allowances, there is real potential for overconsumption of calories and development of obesity.

Although it has proven difficult to assess the impact of neutering on activity of cats, studies have shown a decrease in activity of female cats after being spayed and found feral cats became heavier and less inclined to roam after being neutered (Chandler, 2013).

Effects of neutering on activity may well be mediated through loss of oestrogen hormones in females and testosterone in males. This could also account for failure of neutered dogs and cats to regulate food intake, meaning their appetite control mechanisms consistently fail to balance calorie intake with reduced energy expenditure.

Neutering and diabetes mellitus

It is estimated that as many as one in 50 cats may be diabetic, with the potential for the incidence to increase with an increase in predisposing factors such as obesity and physical inactivity (Rand et al, 2004). The majority of cats are affected by type two or non-insulin dependent diabetes mellitus, in which there is resistance to the action of insulin rather than failure in its production.

It appears certain cats have an underlying predisposition to developing insulin resistance and this can progress to overt diabetes if these individuals gain weight or become physically inactive. This is similar to patterns of diabetes seen in other species, notably humans.

Interestingly, male cats are more likely to become diabetic than females (McCann et al, 2007), which is related to gender differences in insulin sensitivity and a greater predisposition to obesity, especially when neutered. While effects of obesity on insulin sensitivity are well defined, it is less clear whether neutering itself – and specifically, the loss of sex hormones – has a direct effect.

The situation in dogs is different in that they are primarily affected by type one (or insulin dependent) diabetes and obesity does not appear to contribute to this disease. There is also no clear-cut influence from neutering, with studies providing no consistent pattern of risk associated with castration or spaying.

Other neutering health consequences

Urinary incontinence can be a complication of spaying bitches, with the incidence in one study ranging from five per cent in small breeds to 12 per cent in larger dogs (Stöcklin-Gautschi et al, 2001). In that study the incidence was lower in bitches spayed before their first oestrus, than those spayed later, which ran contrary to the widely held perception that neutering at an early age increased the risk of incontinence. Neutered dogs and cats may also be at increased risk of lower

urinary tract diseases.

A study identified spayed female dogs to be at greater risk of developing cutaneous mast cell tumours, suggesting hormonal changes after neutering may play a role in the development of these skin tumours (White et al, 2011).

Countering the risk of obesity and diabetes

Given the principal health consequence of neutering appears to be obesity, which is, in turn, associated with development of diabetes mellitus in cats, attention should be focused on preventing weight gain in dogs and cats that have been castrated or spayed. Since this stems from an imbalance between calorie consumption and energy expenditure, steps need to be taken to control consumption and increase activity.

All the dietary considerations applicable to the control of obesity are applicable here (Watson, 2013). Free access to highly palatable, calorierich pet foods – especially dry diets – should be avoided, along with feeding table scraps, snacks and treats. Calorie intake should be carefully controlled by calculating a daily allowance and feeding only this, with adjustments made according to whether the animal gains or loses weight. These measures should be instituted once the dog or cat has recovered from the neutering surgery.

Commercial diets for neutered dogs and cats are generally formulated along the lines of weight control products with a lower energy density. This means fewer calories are consumed in a set meal size, helping to satisfy appetite while maintaining intake of protein and other essential nutrients. Other features of these diets are a lower fat content and the inclusion of calorie-neutral dietary fibre.

Because the energy density of dry pet foods is four times greater than that of canned, feeding canned, or a mix of canned and dry foods, will substantially dilute a meal's calorie content and, through increased moisture intake, may help to prevent lower urinary tract diseases.

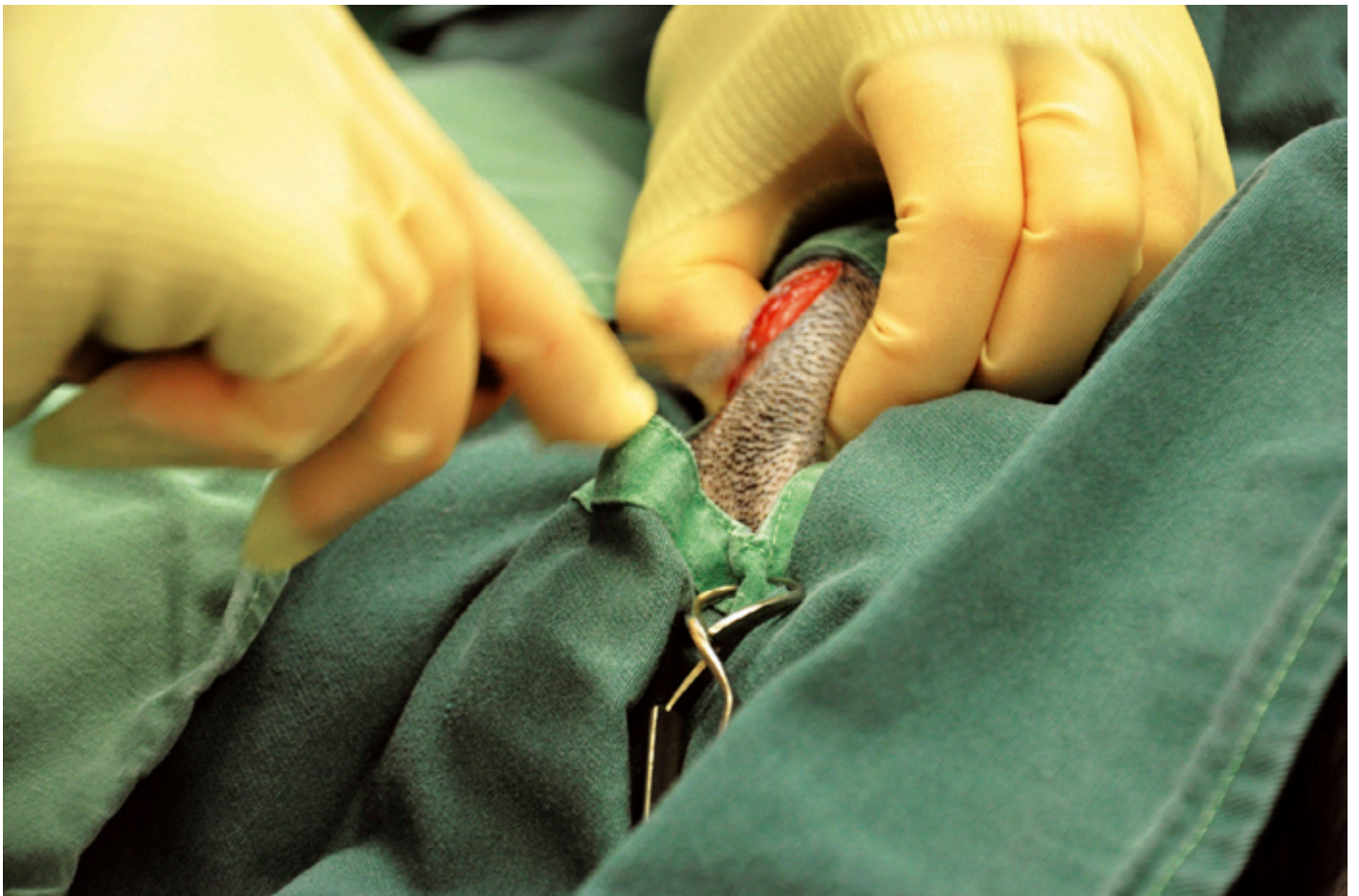
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Neutering leads to weight gain through a combination of reduced physical activity and failure to control calorie consumption.



Castration substantially increases the risks of obesity in dogs and cats, as well as diabetes mellitus in cats.

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