meat, milk, eggs or honey and that there will be no lasting effects to the environment.

Safety issues for humans

The following examples serve to illustrate different aspects of the potential risk to humans arising out of the administration of veterinary medicines.

- Intrinsic toxicity – poisonous chemicals.
- Risk during administration from splashes (eg from pour-on preparations) on the skin or in the eyes and needle stick injuries when medicines are being injected.

Safety issues for animals

Toxicity

A number of adverse reactions are possible, for example allergies or skin eruptions.

Interactions

There is often a possibility of pharmacodynamic and pharmacokinetic interactions between orthodox medicines, orthodox and herbal medicines and herbal and herbal medicines, causing an unexpected outcome.

Reporting of adverse drug reactions

The importance of the reporting of suspected adverse reactions (SARs), including those involving vaccines and injectables, whether affecting the animal or the human administering the medication cannot be overemphasised. The report forms to be sent to the VMD are freely available online at https://www.vmd.defra.gov.uk/adversereaction reporting/

- They're buying the medicines from a reputable, UK-based, accredited retailer.
- They run less of a risk of buying unauthorised, inappropriate or ineffective medicines for their animals.
- They can trust that the retailer meets the requirements of the Scheme and the law.

AIRS is open to all UK-based registered veterinary practice premises, registered pharmacies and approved SQP retailers that supply POM-V, POM-VPS and NFA-VPS veterinary medicines online. It's voluntary and it's free. To help retailers gain accreditation, we've developed a 'Model Internet Retailer' document that acts as a template for an ideal website.

Internet retailers who are interested in gaining accreditation can find the Scheme's requirements, a template and details on how to apply, on the following website: http://tinyurl.com/o3peuax.

CLASSES OF VETERINARY MEDICINES IN IRELAND

The following distribution categories apply to Veterinary Medicines in the Republic of Ireland:

VPO-1 Veterinary Practitioner Only-1, animal remedy which may only be sold supplied and administered by a veterinary practitioner. *There are no products currently authorised as VPO-1 and this classification is likely to be dropped following a forthcoming review by the HPRA.*

VPO Veterinary Practitioner Only, animal remedy which may only be sold and supplied by a veterinary practitioner and administered under the supervision of a VP.

POM Prescription Only, animal remedy which may only be supplied by:

1. A pharmacist from a pharmacy on foot of a prescription.
2. A vet, provided the animal is under his care and he has issued a veterinary prescription.

There is much that an owner can do in order to keep our animals as healthy as possible and to ensure a long and active life. It is interesting that although animal health plans are routinely formulated for farm animals and equines that companion animal health plans have always been conspicuously absent from the literature. This is probably due to the fact that we tend to discourage the thought of companion animals as commodities that require a "plan" to fit all and prefer to think of our pets as individual members of our family. However, there are certain areas of companion animal management and disease prevention that can be implemented that will help to improve or maintain the health status of the individual.

The key areas we should consider when considering a "whole of life" health plan for our companion animals include:

- **Breeding** – Many pedigree breeds experience compromised welfare as a direct result of selective breeding practices. Optimising health and welfare when breeding will help to ensure healthy offspring. Some common breed specific problems are summarised in Table 4.1.
- **Nutrition** is vital in ensuring the optimal health of the individual. Appropriate diets will be required for different life stages such as puppy, adult and senior. Different physiological states such as pregnancy and lactation place particular stresses on the animal's body and an appropriately formulated diet can help support the animal under such physiological stress. "Clinical Diets" are also available that help to support therapy for many illnesses such as diabetes, renal failure and heart disease.
- **Infectious disease prevention** vaccinations are routinely given to cats and dogs, and in recent years, rabbits in the UK and will be required in the young animal as well as further revisits to vets for booster vaccinations.
- **Parasite control** – Ecto- and endoparasites are commonly seen in our companion animal pets and regular preventative treatment will ensure that infestation is minimised.

moderate and, as mentioned above, may not be noticed by the owner.

Non-hypersensitive animal – This animal may show mild to moderate clinical signs, especially if the infestation involves only a small number of fleas. Often the only way an owner will realise the animal is infested is if they actually see a flea, but as mentioned earlier this can be often be very difficult. Owners may also notice flea faeces although they may not realise the significance of these black shapes. Many non-hypersensitive animals are only diagnosed with having fleas when visiting the vets for other routine procedures such as vaccinations.

Sensitised animal – This animal is allergic to the saliva of the flea so when the flea bites the animal this leads to an inflammatory reaction in the skin and clinical signs can be severe. These animals can show many clinical signs even when only a small number of fleas are present and so large numbers of parasites are not required in order to produce severe clinical signs.

Typical clinical signs shown by animals suffering from flea-bite allergy include:

- Pruritus (itchiness).
- Self-trauma – pruritus leads to scratching and biting that can damage the skin. This in turn can lead to secondary bacterial infections. Secondary infections lead to further pruritus and so a cycle is established that worsens the condition over time.
- Crusting – small scabs develop related to the inflammatory reactions that can lead to crusting which are easily seen and felt on the skin.
- Truncated hairs – scratching and biting lead to hair breakage resulting in shortened hairs.
- Alopecia – patches of hair loss is common. A general thinning of the coat may be seen in cats due to the constant over-grooming promoted by pruritus.

Life cycle

The life-cycle of *T. canis* is complex and depends on the age of the dog that is infected. It is shown in Figure 2.3 (*Chapter 2*).

The female worm can produce over 80000 eggs per day and so contamination of the surrounding environment will be significant. Eggs have a tough shell and are well protected from environmental conditions and so can persist for many months or even years. Eggs develop (embryonate) in the environment into a form that is infective to the host. The time taken for development depends largely on environmental conditions, but this can be as fast as a few weeks.

Contamination of the dog occurs in three ways:

- The dog can ingest eggs from the environment (numerous other animals such as insects, worms and rodents can also ingest the eggs and act as paratenic hosts).
- The dog ingests a paratenic host, e.g. rats, mice, rabbits.
- The larval form of the roundworm can be passed from the mother to the puppies via the uterus or milk.

How the life-cycle develops depends largely on the age of the dog.

Older dog (above three months of age) – Worms develop in the intestine into adults in approximately four to five weeks. Under some circumstances the larvae do not develop into adults but migrate into tissues. During pregnancy some of these larvae reactivate and can migrate across the placenta into the puppy. Reactivated larvae can also pass through the mammary gland in the milk and are ingested by the feeding puppies.

Young dog (up to approximately three months of age) – Eggs are ingested by the puppy and instead of developing into adult worms in the intestine the eggs hatch and the larvae undergo a hepato-tracheal (liver to trachea) migration. Once in the trachea the developing worm is coughed up and swallowed back into the intestine where they develop into adult worms.