PARASITICIDES
IVC NEW GRADUATE TRAINING
AGENDA

MARKET OVERVIEW

UK PARASITE RISK

ECTOPARASITES

ENDOPARASITES
UK PARASITICIDE MARKET

MARKET VALUE AND DRIVERS

- The GB Ectoparasite market is currently worth £178.8 million and delivering 10.8% growth.

- New, innovative products are driving the majority of this growth.
UK PARASITICIDE MARKET

PET OWNER BEHAVIOURS

- Average monthly treatments per year
- Year round protection versus reactive
- Source of advice and products
UK PARASITICIDE MARKET

CLINICIANS’ PERSPECTIVE

- Importance of preventative healthcare?
  - Role of healthplans?

- Importance of parasite protection?

- Importance of client engagement and recommendation?
UK PARASITE RISK

Aim is for the needs of the individual practice and pet to be addressed based on disease risk

• The cat flea is the most important parasite of domestic cats and dogs worldwide\(^1\)
• Ticks are a nationwide problem\(^2\) with increased activity in winter months\(^3\)
• Relaxation of the PET travel scheme with increasing movement from abroad
• Toxocara zoonotic risk in UK
• Echinococcus is of continued significance in UK\(^4\)
• Angiostrongylus – widespread but patchy distribution\(^5\)

2. Public Health England Tick Recording Scheme
WHAT IS THE MOST COMMON PARASITE PROBLEM FOR YOUR PET OWNERS?
FLEAS!

- The cat flea is the most important parasite of domestic cats and dogs worldwide\(^6\)

- Fleas are designed to survive. Due to central heating fleas can exist year round\(^7\)

- Perceived by many as ‘dirty’ and ‘disgusting’

- Effective **extended** control is required to prevent disillusionment by clients

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THE FLEA LIFECYCLE

Adults emerge in response to heat, carbon dioxide and movement - i.e. host availability

Larvae feed on ‘flea dirt’ and move downwards, away from light and towards moisture. Larvae moult twice then weave cocoons to protect the nymph stage (pupae)

Adults start to feed in 5 minutes, and mate after 8 to 48 hours. Females lay up to 50 eggs a day, that’s up to 2,500 eggs after 50 days!

Eggs are not sticky: they fall off into the environment - and hatch after 1 to 10 days

MSD Animal Health
FLEAS IN THE ENVIRONMENT

- 3% adult (1-5%)
- 22% eggs (10-34%)
- 29% pupae (8-50%)
- 46% larvae (35-57%)

~ 5% ON PET

~ 95% in environment
THE FLEA LIFECYCLE

IMPORTANCE OF EFFECTIVE CONTROL – FAST ACTING AND DURATION OF EFFECT

“To eradicate an infestation successfully, effective control must be maintained for at least 12 weeks. This duration will lead to cleanup of juvenile flea life stages in the environment.”

CONSEQUENCES OF FLEAS

- **SKIN IRRITATION AND ALLERGIC DISEASE**
  The cat flea is primarily responsible for flea allergy dermatitis (FAD) in dogs and cats

- **BLOOD LOSS**
  A female flea can ingest up to 15 times her bodyweight in blood. Heavy infestations on puppies and kittens may cause anaemia and death

- **TRANSMITTING OTHER DISEASES**
  Dipylidium tapeworm, cat scratch disease (*bartonellosis*), *Rickettsia felis*
THE RISING CONCERN FOR PET OWNERS...
TICKS!

BLOOD-SUCKING ECTOPARASITES AND VECTORS
TICKS!

- Ticks are a nationwide problem with increased activity in winter months\textsuperscript{9}
- Relaxation of the PET travel scheme with increasing movement from abroad
THE TICK LIFECYCLE

- Nymph
- Larva
- Engorged female
- Adult male
- Adult female
- Eggs
TICK DISTRIBUTION IN THE UK

- Most common species:
  - *Ixodes ricinus* (sheep tick)

- Other species endemic in UK:
  - *Ixodes hexagonus* (hedgehog tick)
  - *Ixodes canisuga* (dog tick)
  - *Dermacentor reticulatus* (Ornate dog tick)

THE TICK PICTURE IS EVOLVING

CLASSICAL PICTURE

Rough grazing, moorland, Unimproved pasture, Woodland, woodland edges

Hosts: deer & sheep

Spring & Autumn
THE TICK PICTURE IS EVOLVING

CLIMATE CHANGE

Higher abundance: increased numbers of ticks

Altered phenology: prolonged periods during which conditions are favourable for tick survival and pathogen transmission

Altered geographic distributions: temperate species move to higher latitudes and altitudes, neo-tropical and subtropical species establish in more temperate regions
THE TICK PICTURE IS EVOLVING

INCREASING HOST NUMBERS
THE TICK PICTURE IS EVOLVING

HABITAT MANAGEMENT
TRAVELLING PETS

PETS introduced Feb 2000; amended 2012 - removed compulsory tick treatment for re-entry

Data: AHVLA (courtesy of J.Stokes)
THE RISKS FROM ABROAD

*Dermacentor reticulatus*

- Already established in pockets in the UK
- Widespread distribution across Europe including France
- Vector for Babesia and other tick-borne disease

*Rhipicephalus sanguineus*

- 13 cases found in recent tick surveillance study
- Endemic in Southern Europe. Vector for Babesia and other tick-borne disease
- 3 month life cycle, can survive in the home in UK

THE BIG TICK PROJECT

COLLABORATION BETWEEN THE UNIVERSITY OF BRISTOL AND MSD ANIMAL HEALTH WITH ASSOCIATED CONSUMER FACING CAMPAIGN

www.bigtickproject.co.uk
THE THREAT AND RISKS

THE THREAT FROM ABROAD:

- No longer a requirement to treat on return to the UK
- Big Tick Project\(^9\) found 76% of dogs that had travelled in the previous two weeks returned with ticks
- 13 of the travelled dogs\(^9\) were carrying *Rhipicephalus sanguineus*

THE RISK OF TICKS TO PEOPLE:

Opportunity to educate owners of dogs that pick up ticks to also check themselves and their family. Advice includes:

- Keep arms and legs covered when walking
- Use an effective tick repellent or impregnated clothing
- Perform a ‘tick check’ after potential exposure as the above control measures are not 100%

Further information: Public Health England

During Q3 of 2015, 421 cases of Lyme disease were diagnosed in people in the UK, compared with 300 during Q3 of 2014.

However, 54% of dog owners are unaware Lyme Disease affects both dogs and people.

<table>
<thead>
<tr>
<th>Years</th>
<th>Total reports received</th>
<th>Mean annual rate per 100,000 population</th>
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<tbody>
<tr>
<td>1997 to 2000</td>
<td>803</td>
<td>0.38</td>
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<tr>
<td>2001</td>
<td>268</td>
<td>0.50</td>
</tr>
<tr>
<td>2002</td>
<td>340</td>
<td>0.64</td>
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<tr>
<td>2003</td>
<td>292</td>
<td>0.55</td>
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<td>1.52</td>
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<tr>
<td>2009</td>
<td>863</td>
<td>1.59</td>
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<tr>
<td>2010</td>
<td>905</td>
<td>1.64</td>
</tr>
<tr>
<td>2011</td>
<td>959</td>
<td>1.73</td>
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</tbody>
</table>
LYME DISEASE IN DOGS – THE RISK

LIKELY TO BE UNDERDIAGNOSED

- Clinical signs are vague
- Long incubation period
- Lack of awareness

STUDY FROM UNIVERSITY OF BRISTOL\textsuperscript{12}

Prevalence of Borrelia in ticks on all dogs was 0.5%

Equates to 481 infected ticks per 100,000 dogs (approx 1 in 200)

Big Tick Project

Working with The University of Bristol, the Big Tick Project for Cats found:\n
- Of the 1,855 cats studied, 601 had ticks
- Feline tick prevalence of 6.6%
- *Ixodes ricinus* is the most common tick found

From previous market research, 83% of cat owners when questioned want tick control, now is the opportunity to meet their needs.

WHERE TO FIND TICKS ON YOUR PET – AND ON YOU

ON THE HEAD

BEHIND THE EARS

IN THE ARMPITS

IN THE BELLY BUTTON

ON THE NECK

ON THE REST OF THE BODY

ON THE FORELEGS

ON THE MUZZLE

IN BETWEEN THE PADS

ON THE GROIN

BEHIND THE KNEES

IN BETWEEN TOES

IF YOU FIND A LUMP:

- Part the hair and look at it more closely, or with the help of a magnifying glass if necessary.
- If it's a tick, you may see the tick's legs moving.
- If you see a tick, remove it using either fine-pointed tweezers or a dedicated tick hook. For more information visit bigtickproject.co.uk
FLEA AND TICK CONTROL

SUMMARY

- Fleas are the most common parasite on dogs and cats

- Ticks are a nationwide issue
  - Ticks can be very difficult to see on a dog
  - Many people do not know what they look like

- Education to raise awareness of risk to both our pets and ourselves
WE WANT AN ECTOPARASITICIDE TREATMENT WITH A RAPID AND PERSISTENT SPEED OF KILL THAT PROVIDES YEAR ROUND PROTECTION

Considerations:
- Method of administration
- Duration of action
- Mode of action
- Speed of kill
- Licensed indications
- Safety in multi-pet households
- Legal category
WHY DO OWNERS FEEL FLEA TREATMENTS FAIL?

- INEFFECTIVE PRODUCT
- FORGOTTEN OR MISSED/DELAYED DOSING
- INCORRECT ADMINISTRATION
- NOT DOSING ALL THE PETS (ESP CATS) IN THE HOUSEHOLD
- NOT UNDERSTANDING THE DURATION OF EFFICACY
- PET AND OWNER LIFESTYLE

TO PREVENT WE NEED EVERYONE TO EDUCATE AND ENGAGE IN A CONSISTENT MESSAGE ACROSS THE PRACTICE
Regular treatment is needed to ensure effective treatment and prevention of re-infestation

2010 German survey demonstrated that the majority of dog owners (>56%) failed to apply spot on products as directed\(^\text{13}\)

Estimates suggest that the average dog gets 2.8 spot-on products per year
INTRODUCING BRAVECTO
FLURALANER

*FLURALANER IS A UNIQUE MEMBER OF THE ISOXAZOLINES – THE FIRST NEW CLASS OF ECTOPARASITICIDES IN OVER A DECADE.*

FLURALANER IS THE ONLY 12 WEEK* NOSE-TO-TOES FLEA AND TICK TREATMENT AVAILABLE IN A CHEW OR SPOT-ON.

*Bravecto Chew provides 12-week immediate and persistent killing activity against fleas (*Ctenocephalides felis*), 12-week immediate and persistent killing activity against the ticks *Ixodes ricinus*, *Dermacentor reticulatus* and *D. Variabilis* and 8-week immediate and persistent killing activity against *Rhipicephalus sanguineus*. Bravecto Spot-on for Cats provides 12-week immediate and persistent killing activity against fleas (*Ctenocephalides felis*) and against ticks (*Ixodes ricinus*). Bravecto Spot-on for Dogs provides 12-week immediate and persistent killing activity against fleas (*Ctenocephalides felis* and *C. canis*) and 12-week immediate and persistent killing activity against the ticks *Ixodes ricinus*, *Dermacentor reticulatus* and *Rhipicephalus sanguineus*.
BRAVECTO FAMILY
BRAVECTO OVERVIEW

12-WEEK* FLEA AND TICK PROTECTION FOR DOGS

8-hour speed of kill for fleas*
12-hour speed of kills for ticks*
Licensed from 8 weeks of age
Licensed for FAD
Licensed in pregnancy, breeding and lactation
No known interactions with other medicinal products

*Bravecto Chew provides 12-week immediate and persistent killing activity against fleas (*Ctenocephalides felis*), 12-week immediate and persistent killing activity against the ticks *Ixodes ricinus*, *Dermacentor reticulatus* and *D. Variabilis* and 8-week immediate and persistent killing activity against *Rhipicephalus sanguineus*. Bravecto Spot-on for Cats provides 12-week immediate and persistent killing activity against *C. felis* and against ticks (*I. ricinus*). Bravecto Spot-on for Dogs provides 12-week immediate and persistent killing activity against fleas (*C. felis* and *C. canis*) and 12-week immediate and persistent killing activity against the ticks *I. ricinus*, *D. reticulatus* and *R. sanguineus*. 
BRAVECTO OVERVIEW

12-WEEK* FLEA AND TICK PROTECTION FOR CATS

12-hour speed of kill for fleas*
48-hour speed of kills for ticks*
Licensed from 11 weeks of age
Licensed for FAD
No known interactions with other medicinal products

*Bravecto Chew provides 12-week immediate and persistent killing activity against fleas (Ctenocephalides felis), 12-week immediate and persistent killing activity against the ticks Ixodes ricinus, Dermacentor reticulatus, and D. Variabilis and 8-week immediate and persistent killing activity against Rhipicephalus sanguineus. Bravecto Spot-on for Cats provides 12-week immediate and persistent killing activity against fleas (Ctenocephalides felis) and against ticks (Ixodes ricinus). Bravecto Spot-on for Dogs provides 12-week immediate and persistent killing activity against fleas (Ctenocephalides felis and C. canis) and 12-week immediate and persistent killing activity against the ticks Ixodes ricinus, Dermacentor reticulatus and Rhipicephalus sanguineus.
ENDOPARASITE CONTROL
ENDOPARASITES IN THE UK

WORMING REGIME WILL DEPEND ON THE LIFESTYLE AND RISK FACTORS OF THE INDIVIDUAL

Worms of main concern in the UK:

- Roundworm (Toxocara)
- Tapeworm
- Lungworm (A.vasorum)
REDUCING THE WORM RISK – GENERAL ADVICE

- Practice good personal hygiene, particularly washing hands after handling pets and before eating food.
- Aim to prevent infection by reducing, where possible, the risk of the pet acquiring infection. Consider pets' age, health, and lifestyle (young, kennel, travelling, nutrition status, etc).
- Clean up pet faeces to reduce environmental contamination with parasites. Groom dogs regularly.
- Fence off play areas and cover sandpits.
WORMING FOR TOXOCARA CONTROL

- All cats and dogs should be routinely treated due to the risk of human infection
- Puppies and kittens provide the largest source of potential infection

Pups:
- Start at two weeks of age, repeated at 2 weekly intervals until 2 weeks post weaning and then monthly until 6 months old.
- To eliminate *T.canis* egg shedding from trans-placental and trans-mammary infection and prevent significant populations establishing in the intestine.

Kittens:
- First treatment at 3 weeks old as there is no trans-placental transmission.
WORMING FOR TOXOCARA CONTROL

- **Bitch and Queen:**
  - Autoinfection can occur during lactation so they should be treated at the same time as the puppies and kittens.

- **Adults:**
  - Use of an effective anthelmintic every 3 months significantly reduces *Toxocara spp* ova shedding in cats and dogs. This frequency should be a minimum recommendation.
  - Use of a monthly anthelmintic will reduce egg output by over 90% and whether this is necessary will depend on the pet’s lifestyle. Those pets hunting, in regular contact with young children or immune suppressed individuals should be dewormed monthly.

- **Indoor Pets**
  - May have reactivation of arrested larval stages from puppy and kitten-hood and should therefore be treated at least 4 times a year.
WORMING FOR TAPEWORM CONTROL

TAENIA, DIPYLIDIUM

– Distressing to see and can cause local irritation
– Dipylidium is zoonotic, particularly to children
– Long term control of Dipylidium relies on effective flea control
– Control of canine tapeworm infection is vital to reduce economic impact though meat and offal condemnation from Taenia ovis and Taenia hydatigena

ECHINOCOCCUS IS A SERIOUS ZOONOTIC RISK

– E.granulosus – hydatid disease – a potentially fatal cystic disease of the lungs and found in the UK.
– E.multilocularis – Alveolar echinococcosis – a fatal disease affecting the liver and lungs found in Europe
– Control is vital to reduce the severe and potentially increasing zoonotic risk of Echinococcus granulosus.
– PET travel requirement before re-entering UK to reduce the risk of E.multilocularis
WORMING FREQUENCY FOR TAPEWORM CONTROL

ECHINOCOCCUS

DOGS FED UNPROCESSED RAW DIETS, OFFAL OR EXPOSURE TO RUMINANT CARCASSES

- Traditional *E.granulosus* endemic areas (Mid Wales, the Welsh border, Herefordshire and the Western Isles of Scotland) should be dewormed with praziquantel at least every 6 weeks.
- Outside of these areas there may still be the potential for exposure as *E.granulosus* cysts have been found in abattoirs around Britain in carcasses distributed from Wales. There are examples of population groups in Wales and Asia where treatment of dogs every 3 months has reduced human hydatid disease over time so this should be a minimum recommendation for dogs whose lifestyle puts them at risk outside of these areas.

AS ABOVE BUT DOG ALSO HAS ACCESS TO LIVESTOCK PASTURE

- To reduce meat and offal condemnation rates, these dogs should be treated for tapeworm monthly.
WORMING FREQUENCY FOR TAPEWORM CONTROL

TAENIA AND DIPYLIDIDIUM

DIPYLIDIDIUM HAS A ZOONOTIC RISK

PROGLOTTID SHEDDING CAN BE DISTRESSING TO A PET OWNER

- Consideration should be given to dogs being treated monthly for tapeworm to eliminate proglottid shedding, potentially increasing the human-animal bond.
- Cat *Taenia* spp have no zoonotic potential and rarely cause adverse clinical signs, however hunting cats will develop large burdens that may have adverse effects, and shed proglottids which can erode the human animal bond. Actively hunting cats should be treated for tapeworm monthly.
WORMING FOR LUNGWORM CONTROL

POTENTIAL FOR SEVERE DISEASE

*A. vasorum* is thought to be endemic throughout the UK but distribution is not uniform with some areas remaining free of infection. Monthly preventative treatment in known endemic high prevalence foci. Elsewhere, monthly treatment should be employed on the basis of risk assessment.

- Include dogs living in areas where cases have been reported and those that deliberately eat slugs and snails or serially eat grass which may contain small slugs.
- Knowledge of local cases, use of case distribution maps (e.g. Idexx) and screening of suspected cases will help to assess whether *A. vasorum* is prevalent in a particular location.
- Dogs that have previously been infected should be routinely treated as there is no lasting protective immunity to lungworm and lifestyle is likely to lead to re-exposure.
## SUGGESTED WORMING REGIME SUMMARY\textsuperscript{31,32}

<table>
<thead>
<tr>
<th>Lifestage</th>
<th>Endoparasite Risk</th>
<th>Worming Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Newborn until 2 weeks post weaning</strong></td>
<td>Toxocara from in utero (dog) and via milk</td>
<td>Worm fortnightly from 2 weeks of age until 2 weeks post weaning with product easy to administer. Worm bitch at same time as first dose</td>
</tr>
<tr>
<td><strong>Puppy or Kitten &lt; 6 months</strong></td>
<td>Roundworm and Tapeworm</td>
<td>Worm monthly with licenced product for roundworm and tapeworm until 6 months</td>
</tr>
<tr>
<td><strong>Dog or Cat &gt;6 months. Dog exercised in own garden or on short lead walks. Indoor Cat. No immunocompromised people</strong></td>
<td>Tapeworm (from fleas), roundworm</td>
<td>With regular flea control, worm with licenced product for roundworm and tapeworm at least every 3 months</td>
</tr>
<tr>
<td><strong>Dog or Cat &gt; 6 months. Outdoor access. No immunocompromised people</strong></td>
<td>Roundworm, tapeworm, lungworm (especially if younger dogs or geographical area of risk)</td>
<td>Worm monthly with product licensed to prevent lungworm as well as for roundworm and tapeworm</td>
</tr>
<tr>
<td><strong>Adult dog or cat, immunocompromised people</strong></td>
<td>Higher risk of zoonotic transfer of toxocara, also risks of other roundworm, tapeworm, lungworm (especially if a younger dog or geographical area of risk)</td>
<td>Worm monthly with product licensed to prevent lungworm as well as for roundworm and tapeworm</td>
</tr>
<tr>
<td><strong>Adult dog travelling outside of the UK</strong></td>
<td>Heartworm, roundworm and Tapeworm (inc. E.multilocularis)</td>
<td>Worm monthly and discuss requirements based on location travelling to inc vaccination, worming needs, leishmania risk</td>
</tr>
</tbody>
</table>

\textsuperscript{31}: Worm Control in Dogs and Cats ESRCAP Guidelines 2010
\textsuperscript{32}: Control of Ectoparasites in Dogs and Cats ESRCAP Guidelines 2015
BRAVECTO AT THE CORE OF PARASITE CONTROL

Use Bravecto alongside Milbemycin Oxime/Praziquantel to allow broad, effective parasite cover tailored to your client’s needs based on parasite risk.
QUESTIONS?
Bravecto® contains fluralaner and is indicated for the treatment of flea and tick infestations in dogs and cats. POM-V *

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Refer to the packaging or package leaflet for information about side effects, precautions, warnings and contraindications. Further information is available from the SPC / Datasheet or MSD Animal Health, Walton Manor, Walton, Milton Keynes MK7 7AJ.

Advice should be sought from the medicine prescriber.

**Use medicines responsibly.** For more information please refer to the Responsible Use sections of the NOAH website.