Biogal | ACADEMY

● LIVE WEBINAR

FELINE VACCINATION FROM KITTENS
TO SENIOR CATS TRICKS AND HOAXES

Dr. Paola Dall'Ara
Prof. DVM, PhD

October 19 | 17:00 CET

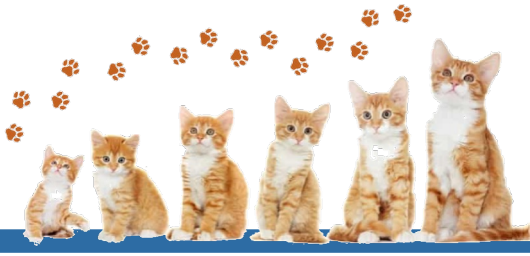
FELINE VACCINATION FROM KITTENS TO SENIOR CATS:

tricks & hoaxes

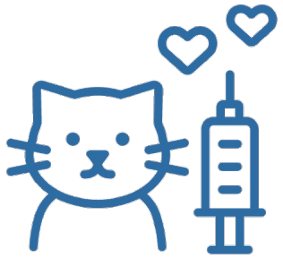
Paola Dall'Ara

divas
DIPARTIMENTO DI MEDICINA VETERINARIA E SCIENZE ANIMALI

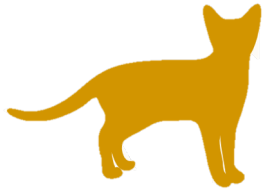
HOW TO CONSIDER TO START?



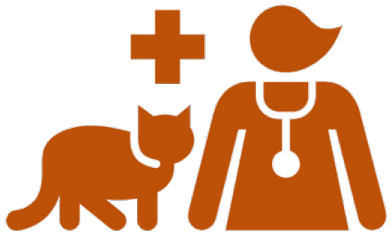
THE OWNER



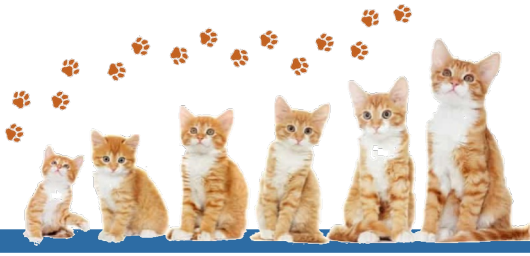
THE VACCINE



THE CAT



THE VACCINATION



THE OWNER

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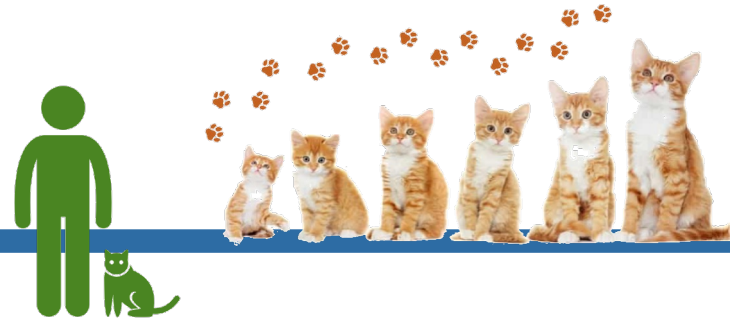
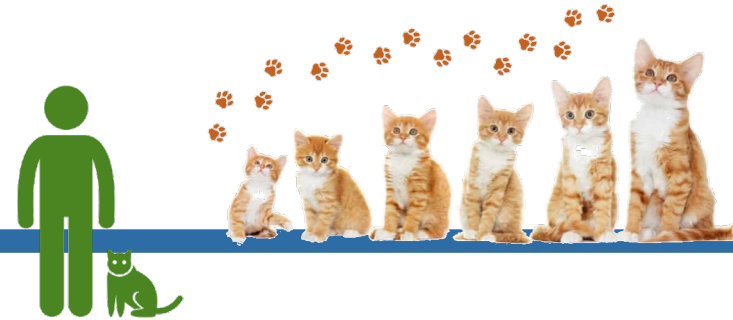


- market surveys
  - the **owner** wants to get involved with the **vet**
  - the **owner** wants to establish an empathic relationship with the **vet**
- how vets have to **communicate** with owners:
  - provide complete, updated, and scientifically correct information
  - times and contents must be adapted to the owner's cognitive and emotional needs
  - communication must be coherent and structured in order to correctly orient the owner's decisions
  - posture and body language are very important

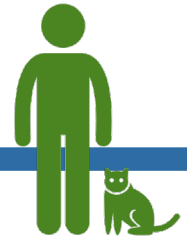
THE OWNER

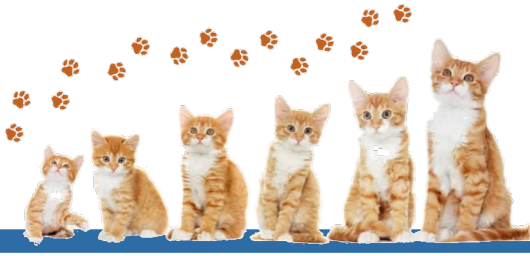


Vaccination guidelines for owners

- in addition to the publication of the vaccination guidelines for vets, many international associations intelligently decided to publish similar but simplified guidelines for owners and breeders

THE OWNER





WSAVA Global Veterinary Community | Vaccination Guidelines Group

https://wsava.org/wp-content/uploads/2020/01/WSAVA-Owner-Breeder-Guidelines-2015_1.pdf

https://catvets.com/public/PDFs/ClientBrochures/ClientHandoutVaccination.pdf

American Association of FELINE PRACTITIONERS®

https://www.aaha.org/your-pet/pet-owner-education/aaha-guidelines-for-pet-owners/

AAHA

BSAVA BRITISH SMALL ANIMAL VETERINARY ASSOCIATION

https://www.bsava.com/Resources/Pet-owner-resources/PetSavers-guides

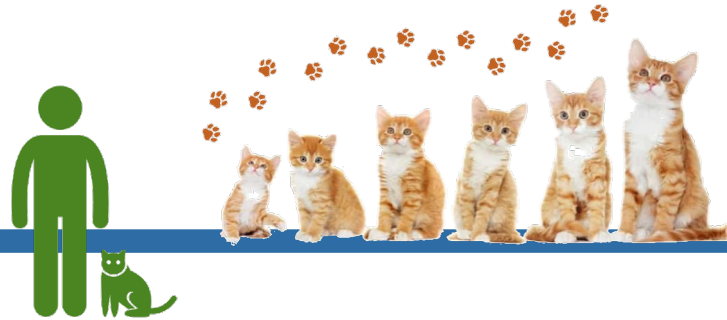
https://www.vetvoice.com.au/ec/pet-ownership/vaccination-for-pets/

AVA AUSTRALIAN VETERINARY ASSOCIATION

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/368589/PCDOCS-_305476-v3-VMD_Leaflet_012_A_-_Vaccines_for_dogs_and_cats_-_Advice_for_Owners.PDF

VETERINARY MEDICINES VMD DIRECTORATE

THE OWNER



WSAVA Global Veterinary Community | Vaccination Guidelines Group

WORLD SMALL ANIMAL VETERINARY ASSOCIATION

2015 VACCINATION GUIDELINES FOR THE OWNERS AND BREEDERS OF DOGS AND CATS

WSAVA Vaccination Guidelines Group

https://wsava.org/wp-content/uploads/2020/01/WSAVA-Owner-Breeder-Guidelines-2015_1.pdf

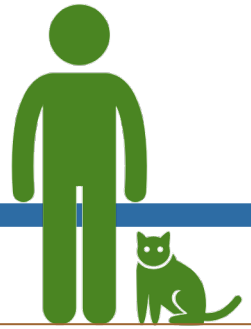
CONTENTS

Vaccinations for Your Cat

Pet Owner Guide

Sponsored by Boehringer Ingelheim

The content of these Guidelines has been solely created by the AAFP Feline Vaccination Advisory Panel members.



https://catvets.com/public/PDFs/ClientBrochures/ClientHandoutVaccination.pdf

Vaccinations for Your Cat

Pet Owner Guide

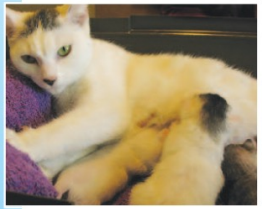
WHY DOES MY CAT NEED TO BE VACCINATED?

Vaccines help to protect against specific infectious diseases caused by some viruses and bacteria. They stimulate the body's immune system to destroy the organism and 'remember' it so that it can fight against infection again if necessary in the future. Without vaccination, many cats become seriously ill or may even die from diseases that their immune system is unable to fight effectively on its own. The use of vaccines has prevented death and disease in millions of cats. In addition, vaccines protect people from disease, such as rabies, that could be transmitted from cats.

Some diseases are easier to vaccinate against than others. For example, vaccination is very effective against feline parvovirus infection (panleukopenia) but does not completely protect against respiratory virus infections. However, cats vaccinated against respiratory tract infections generally have milder illness than if they hadn't been vaccinated and are far less likely to die from the disease.

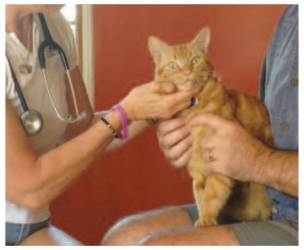
WHY DOES MY KITTEN NEED A SERIES OF MORE THAN ONE VACCINE?

Newborn kittens depend on their mothers not just for food and warmth, but also for protection against infectious diseases. The first few times they nurse, kittens get antibodies from their mother's milk that will help to keep them safe for a few weeks to several months. This immunity provided by "maternally derived antibodies" (MDA) is protective while a kitten's own immune system is immature. However, if the antibody levels decrease before the kitten has developed his/her own immunity, gaps in protection will occur, leaving the kitten susceptible to disease. Also while the kitten has high levels of MDA, their immune system will not respond optimally to vaccination. Since we cannot predict for each kitten when MDA has decreased adequately to allow an effective response to vaccination, guidelines have been developed to protect as many kittens as possible against disease by giving a series of vaccinations. An incomplete series of kitten vaccinations may leave your kitten vulnerable to infection, so it is important to follow your veterinarian's recommendations and vaccinate up to at least 16 weeks of age.



HOW OFTEN DOES MY CAT NEED TO BE RE-VACCINATED?

Many things need to be taken into consideration when deciding how often your cat needs to be vaccinated. These include such things as:

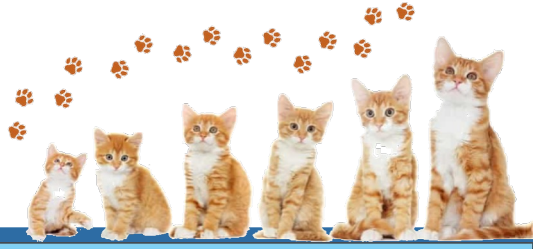


- health status
- age and lifestyle of the cat
- how long a specific vaccine provides protection for ("duration of immunity")
- how likely the cat is to be exposed to the infectious agent
- how dangerous this agent might be
- licensing regulations in each country

This is why re-vaccination intervals may vary, both from cat to cat, home to home, and with different diseases. Your veterinarian will be able to customize a vaccination schedule for your individual cat.

WHAT ARE THE RISKS OF VACCINATIONS?

The benefits of vaccination greatly outweigh possible risks. Just as in children, following vaccination your cat may experience mild and short-lived reactions (malaise), such as poor appetite, lethargy, and fever that resolve without treatment. Any symptoms that persist for more than a day or two should be discussed with your veterinarian. Rarely, more serious allergic reactions occur and may include vomiting, diarrhea, facial swelling, or difficulty breathing. These serious reactions appear within minutes or hours of vaccination and require *immediate* veterinary care. Another uncommon reaction is a tumor at the injection site that develops months or years after vaccination. Talk to your veterinarian about any persistent lumps or swellings at injection sites.



WHAT VACCINATIONS DOES MY CAT REQUIRE?

The vaccines *your* cat needs will depend on his/her health status, age, lifestyle, and what diseases are common in your area. In some areas, rabies vaccination is required by law to protect both animals and people. If you travel with your cat, your veterinarian may advise vaccination against diseases in the areas you visit. It is important to remember that even cats living totally indoors require regular vaccination as they may be exposed to diseases in many circumstances (such as travel or boarding, interaction with other cats, the addition of a new cat to the home and even viruses carried on your clothing). Your veterinarian is the best person to evaluate your cat's individual needs in order to discuss which vaccines are necessary and how often they should be given to provide the best protection for your cat.

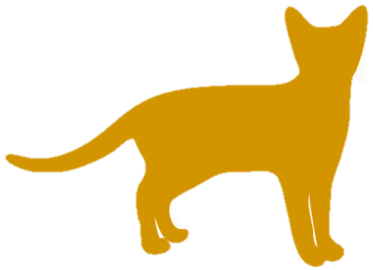
You are an important member of your cat's healthcare team. You can be instrumental in helping with the success of treatments and improved healthcare for your cat.

We wish to thank Boehringer Ingelheim for sponsoring this document.

To access the full guidelines document, please visit www.catvets.com/guidelines and to download additional copies, visit www.catvets.com/cat-owners/brochures.

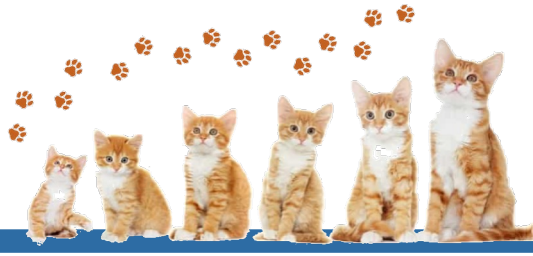
Boehringer Ingelheim

www.catvets.com



THE CAT

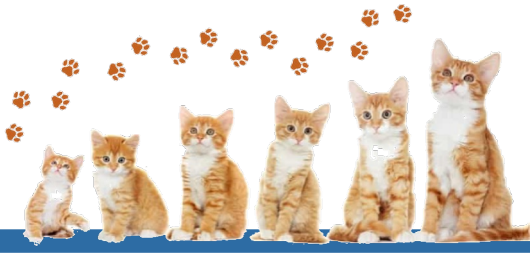
CATS ARE NOT ALL THE SAME



- cats are not the same for
  - age
  - sex and reproductive status
  - lifestyle

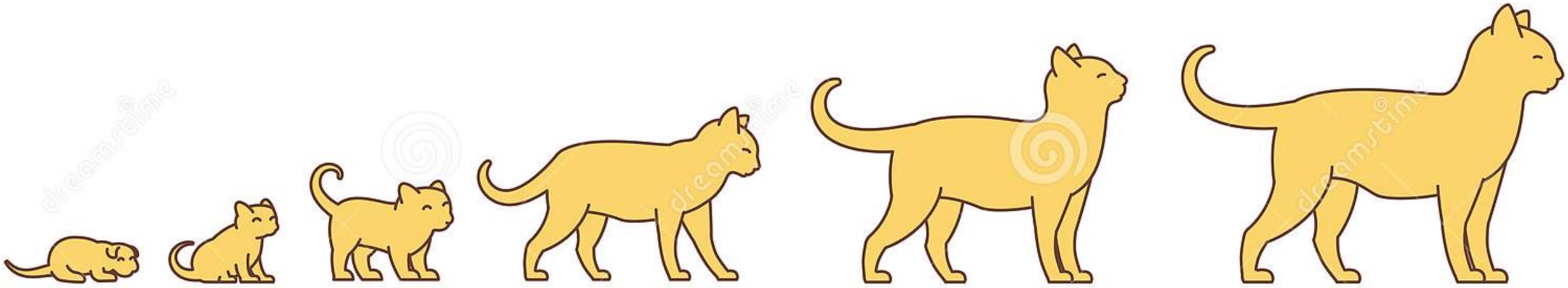
➡ vaccination must be «tailored» for each single cat based on these characteristics

CATS ARE NOT THE SAME FOR

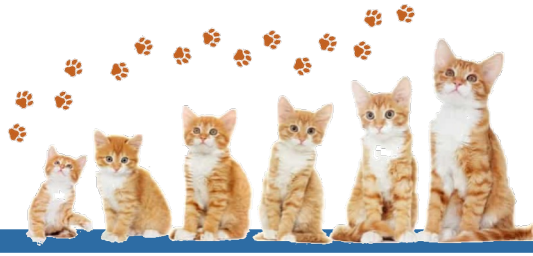


AGE

(kitten / young / adult / senior)



THE CAT - AGE



2021 AAHA/AAFP Feline Life Stage Guidelines

Journal of Feline Medicine and Surgery (2021) **23**, 211–233

Table 1 Feline life stages

Kitten	Young adult	Mature adult	Senior
Birth up to 1 year	1–6 years	7–10 years	>10 years

End of life
Variable

THE CAT - AGE

CAT CAREGIVERS: Visit **catfriendly.com** for more helpful information and sign up for our newsletter, **The Cat Column**

FELINE LIFE STAGES

KITTEN
BIRTH UP TO 1 YEAR

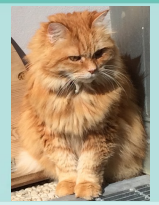
Veterinary Checkups: Minimum of One Per Year

YOUNG ADULT
1 – 6 YEARS

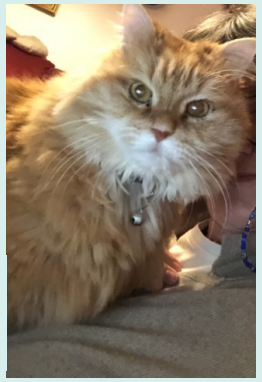
Veterinary Checkups: Minimum of One Per Year

MATURE ADULT
7 – 10 YEARS

Veterinary Checkups: Minimum of One Per Year



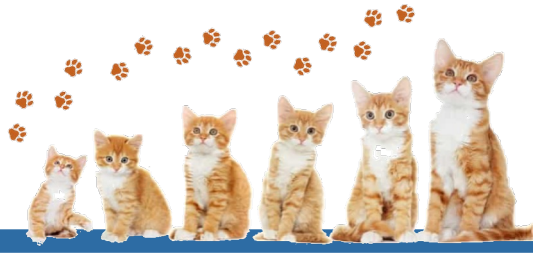
SENIOR
10 YEARS +



Veterinary Checkups: Minimum of Every 6 Months

1 MONTH	1 YEAR
3 MONTHS	4 YEARS
6 MONTHS	10 YEARS
1 YEAR	15 YEARS
2 YEARS	24 YEARS
3 YEARS	28 YEARS
4 YEARS	32 YEARS
6 YEARS	40 YEARS
7 YEARS	44 YEARS
8 YEARS	48 YEARS
9 YEARS	52 YEARS
10 YEARS	56 YEARS
11 YEARS	60 YEARS
12 YEARS	64 YEARS
13 YEARS	68 YEARS
14 YEARS	72 YEARS
15 YEARS	76 YEARS
16 YEARS	80 YEARS
17 YEARS	84 YEARS
18 YEARS	88 YEARS
19 YEARS	92 YEARS
20 YEARS	96 YEARS
21 YEARS	100 YEARS
25 YEARS	116 YEARS

THE KITTEN



- in **kittens** ➡ immunity doesn't work very well
  - 10–30% of live-born pets die before reaching 21 days old (3 weeks)
    - 70% of these ➡ die in the first week after birth
    - in the first 3 days of life ➡ mainly for septicemia

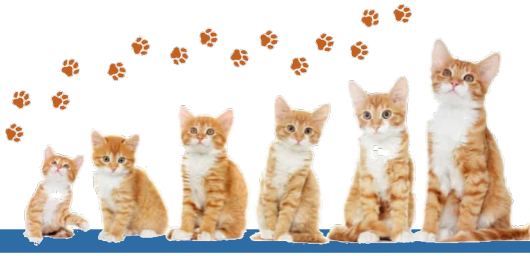
THE KITTEN

- kittens can fail to mount an effective immune response when they encounter for the first time an unknown antigen

- **PRIMARY immune response** ➡
  - antibodies ➡ slow to appear
  - antibody titres ➡ low
  - **D**uration **O**f **I**mmunity (**DOI**) ➡ limited (sometimes totally disappear)

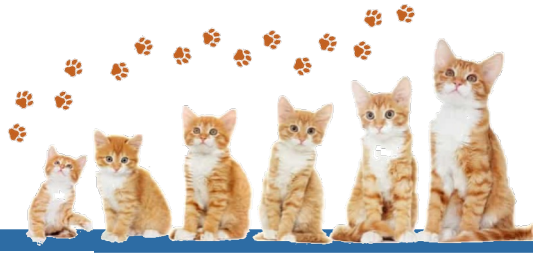
➡ but in the meantime many **memory cells** are produced…

THE KITTEN



- … over the time, memory cells proliferate and when the kitten encounters the same known antigen for the 2nd (3rd, 4th, …) time
  - **SECONDARY (anamnestic) immune response** ➡
    - response ➡ much more faster
    - antibody titres ➡ much more higher
    - **DOI** ➡ much more longer (months/years)

THE KITTEN



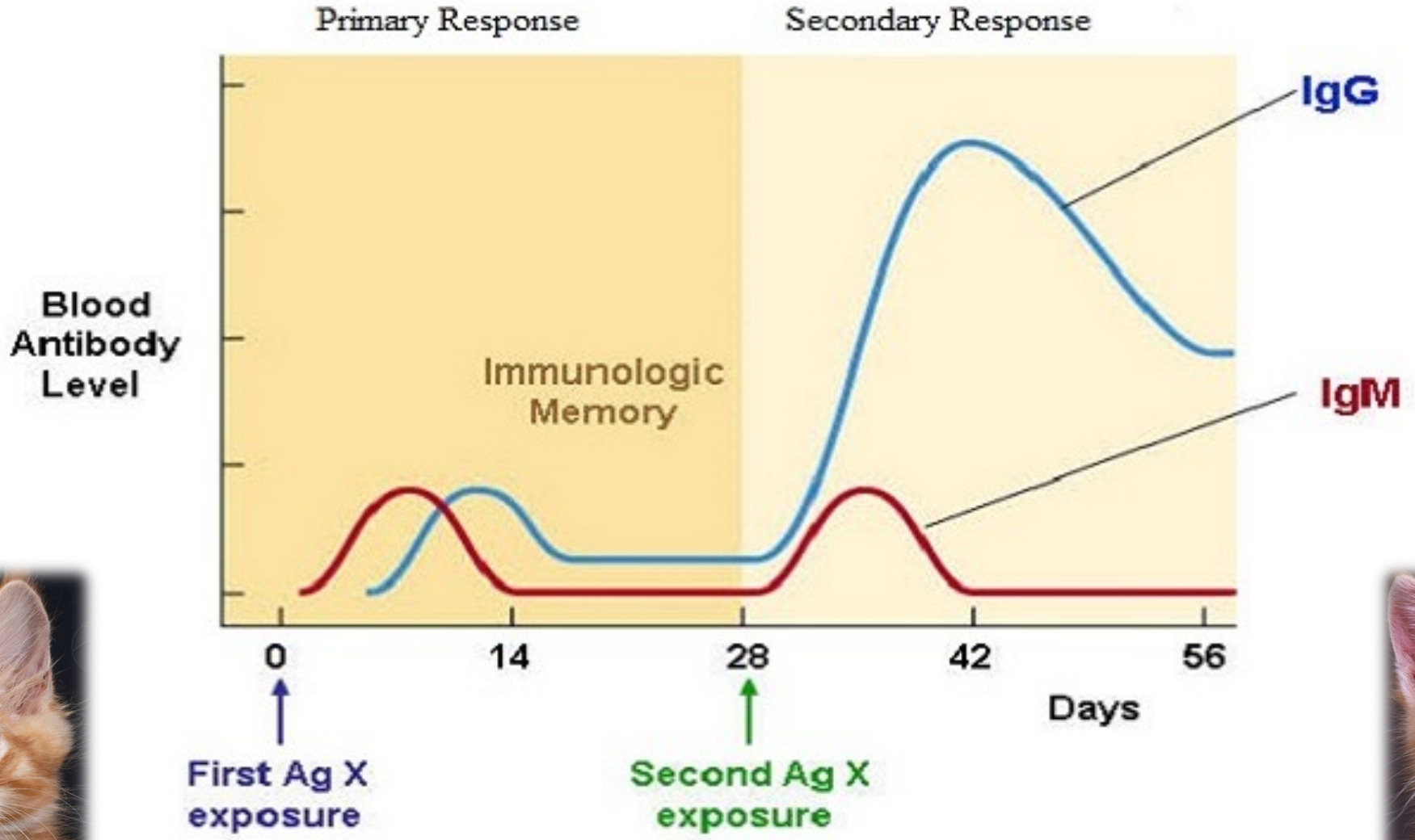


Fig. Immune Response and Secretion of antibodies

THE KITTEN

➡ endotheliochorial placentation ➡

- relatively impenetrable barrier to the in-utero antibody transfer
  - only small IgG amounts pass through this barrier ➡ very low systemic immunity
- **transfer of passive immunity** ➡ post partum ➡ via **colostrum**
  - great variability in colostral immune quality
    - among queens
    - among mammary glands of the same queen
- colostrum ➡ fundamental for kittens' survival
  - it ensures both nutrient and immunity provision

Maternally-Derived Antibodies ➡ **MDA**

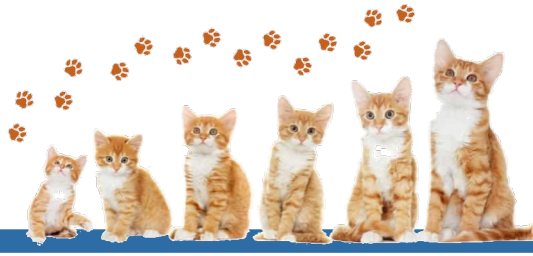
THE DARK SIDE OF MDA

MDA transfer ➡ double edged weapon

- it helps in reducing neonatal mortality and in increasing kittens (& puppies) survival rate
- it can interfere with kittens (& puppies) vaccination
  - interference is variable, depending on many factors

VACCINE FAILURE

THE KITTEN

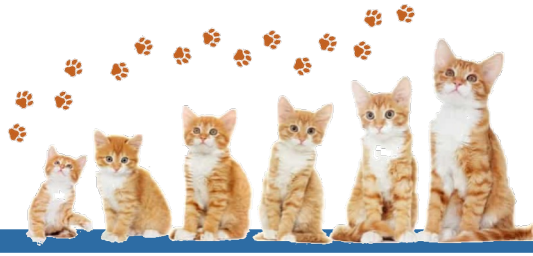


- how many MDA pass to newborns?
- how long MDA last?
- how long MDA interfere with vaccination?

➡ all depends on **antibody half-life** in offspring, depending on:

- maternal antibody titers
- colostrum quality (IgG amounts)
- amount of colostrum intake
- amount of absorbed colostrum
- MDA specificity (depending on the pathogen)
- individual (genetic) response (in dogs)
- breed size (in dogs)
- vaccine immunogenicity

WHEN MDA BEGIN TO DROP?



- starting from 8-12 weeks of age, **MDA begin their decline** very slowly

FELINE DISEASE	MDA half-life (days)	Protection duration (weeks)
Panleukopenia (FPV)	9.6	10-14
Herpesvirus infection (FHV-1)	8	8-10
Calicivirus infection (FCV)	10	10-14

THE OLDER CAT

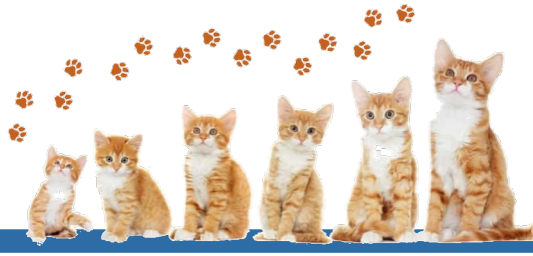
- in the elderly ➡ all districts suffer from the ageing process
  - immune system ➡ decline in immune defenses (> cell-mediated)
  - non-perfect response to vaccination
  - difficulties only towards new antigens (memory continue to work!)

CATS ARE NOT THE SAME FOR

SEX AND REPRODUCTIVE STATUS

(intact / neutered / pregnant)

THE QUEEN



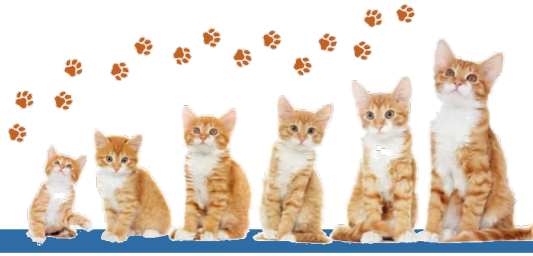
does a pregnant cat need to be vaccinated?

- vaccination of a pregnant female (queen/bitch) ➡ would be avoided
  - avoid potential risk to fetus
- if it is not possible (eg, outbreak, movements abroad) ➡ use only vaccines registered for this period
  - carefully read the vaccine leaflet!
  - Italy ➡ NO vaccines available for pregnant queens (apart rabies)

CATS ARE NOT THE SAME FOR

LYFESTILE
(indoor / outdoor)

THE CAT - LIFESTYLE

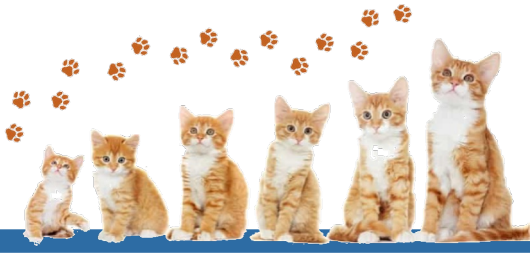


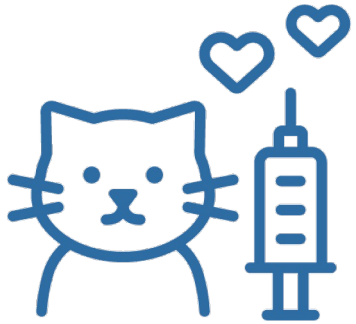
cats at LOW risk

- solitary cats
- indoor cats (they never go out)
- never boarding cattery
- they don't travel

cats at HIGH risk

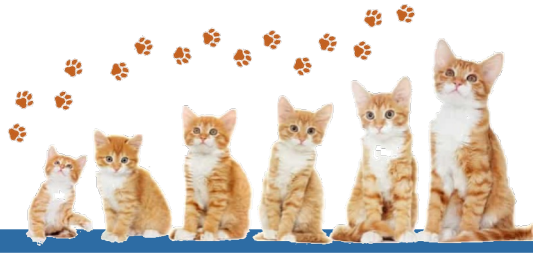
- multicat household
- outdoor, indoor/outdoor
- often boarding cattery
- they sometimes travel





THE VACCINE

VACCINES ARE NOT ALL THE SAME



NON-INFECTIOUS vaccines

- when administered ➡ **they <u>don't</u> replicate**
  - killed (inactivated) vaccines
  - subunit vaccines (synthetic and recombinant)

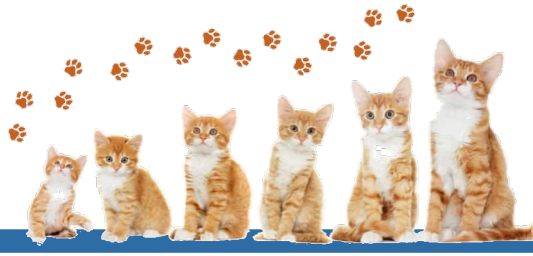
these represent
EXOGENOUS antigens
→ > humoral immunity

INFECTIOUS vaccines

- when administered ➡ **they replicate**
  - modified live (attenuated) vaccines (**MLV**)
  - vectored vaccines

these represent
ENDOGENOUS antigens
→ > cell-mediated immunity

NOT ALL VACCINES FOR ALL ANIMALS



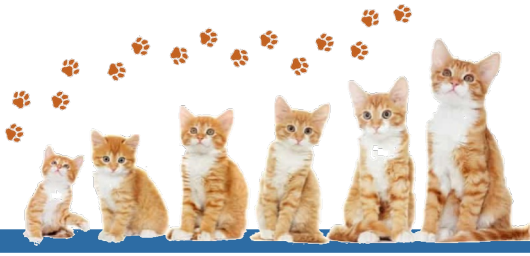
- **CORE vaccines (recommended)**
  - for contagious, widespread, and life-threatening diseases
- **NON-CORE vaccines (optional)**
  - recommended in case of real risk of exposure, based on lifestyle and epidemiological risks
- **CIRCUMSTANTIAL vaccines**
  - non-core vaccines promoted to core for real risk
- **NOT RECOMMENDED vaccines**
  - little evidence of benefits

Rabies

Leptospirosis

FeLV

HOW CLASSIFY DOG & CAT VACCINES



CORE vaccines

- Parvoviral infection
- Distemper
- Infectious hepatitis

CIRCUMSTANTIAL vaccines

- Rabies
- Leptospirosis

NON-CORE vaccines

- Parainfluenza
- Leishmaniosis
- *Bordetella bronchiseptica* infection
- CIRDC (Canine Infectious Respiratory Disease Complex)
- Herpesvirus infection
- Lyme disease (*Borrelia burgdorferi*)
- Piroplasmosis (*Babesia canis*)
- Dermatophytosis (*Microsporum canis*)
- Influenza

NOT RECOMMENDED vaccines

- Coronavirus infection

CORE vaccines

- Panleukopenia
- Herpesvirus infection
- Calicivirus infection

CIRCUMSTANTIAL vaccines

- Rabies
- Feline leukemia (FeLV)

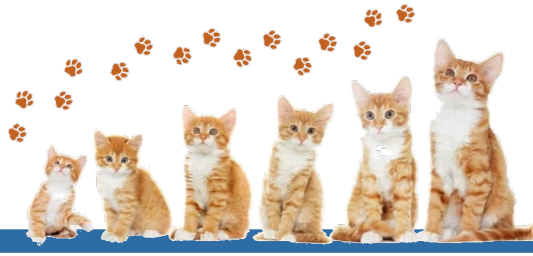
NON-CORE vaccines

- Feline immunodeficiency (FIV)
- *Chlamydophila felis* – *Ch. psittaci* infection
- *Bordetella bronchiseptica* infection
- Dermatophytosis (*Microsporum canis*)

NOT RECOMMENDED vaccines

- Feline infectious peritonitis (FIP)

HOW CLASSIFY DOG & CAT VACCINES !



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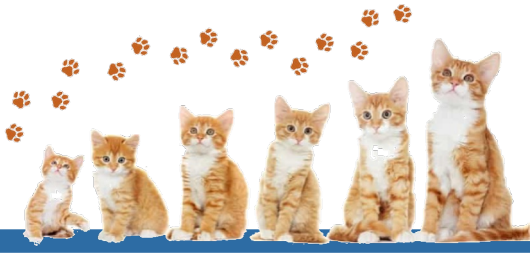
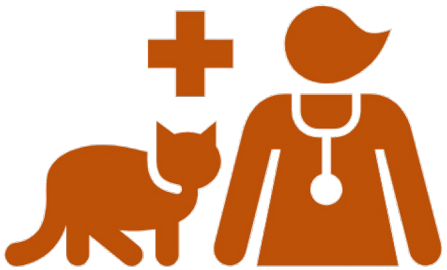
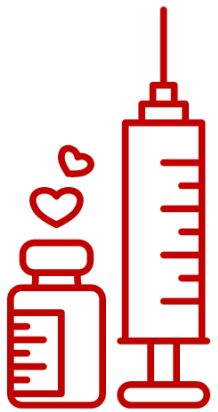




THE VACCINATION

WHAT VACCINATION IS?

VACCINATION ➡ «the introduction into humans or animals of whole microorganisms, parts of them or their products previously treated to make them harmless, for the purpose of inducing the development of immunity & protecting them against infectious diseases»

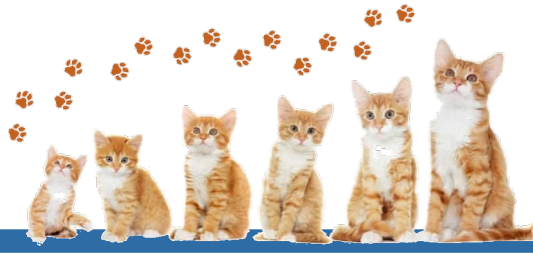


<u>fundamental</u> ➡

starting from

PUPPIES & **KITTENS**!!!

IS THERE A SINGLE DEFINITION?



vaccination is a «trick» to mislead the immune system

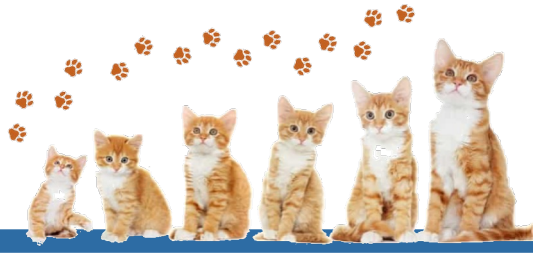
making it believe it has to fight an infection

the more the vaccine will be similar to the «true» offender

and will activate the immune defenses like the field pathogen,

the more the trick will work!

PROTECTION IS NOT ALWAYS THE SAME



NON-INFECTIOUS vaccines

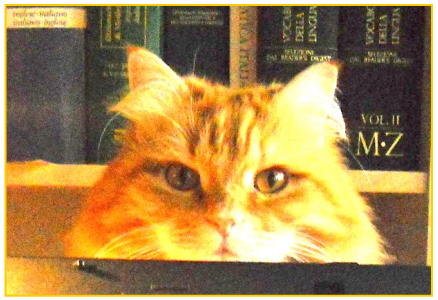
- not complete immune response
- annual boosters (generally…)

INFECTIOUS vaccines

- complete immune response
- after first vaccination series ➡ protection much longer than 1 year

IS VACCINATION STILL IMPORTANT TODAY?

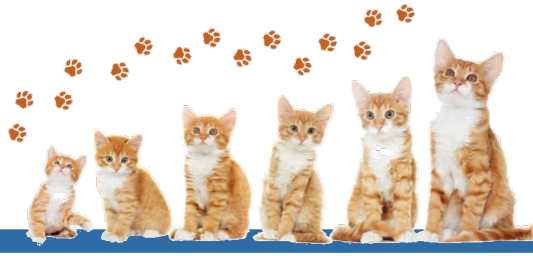
- it is the **most successful health measure**
  - both in medical and in veterinary practice
- it plays an essential role in **control** of many dangerous diseases
  - eradication of smallpox ( ) and rinderpest ( )
  - almost eradication of polio ( ) and many other diseases
- it is the **safest health measure** we have!
  - incidence of side effects ➡ very low



2013 AAFP Feline Vaccination Advisory Panel Report

Although the administration of biological products can never be entirely free of risk, in general currently available feline vaccines have an excellent safety record. It is important to

VACCINATION GUIDELINES FOR VETS



THE WORLD SMALL ANIMAL VETERINARY ASSOCIATION

WSAVA
Global Veterinary Community

Vaccination Guidelines Group

isfm

American Association of FELINE PRACTITIONERS

AAHA®

EUROPEAN ADVISORY BOARD ON CAT DISEASES
ABCD

UCDAVIS
VETERINARY MEDICINE

BSAVA
BRITISH SMALL ANIMAL VETERINARY ASSOCIATION

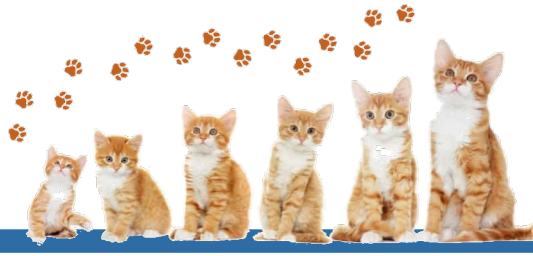
AVA
AUSTRALIAN VETERINARY ASSOCIATION

CVMA ACMV

CANADIAN VETERINARY MEDICAL ASSOCIATION

L'ASSOCIATION CANADIENNE DES MÉDECINS VÉTÉRINAIRES

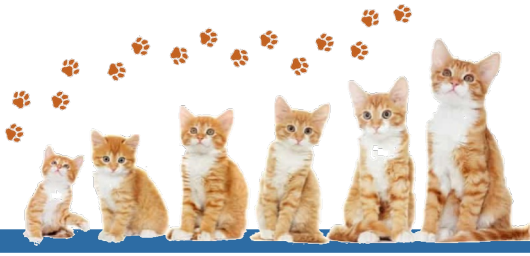
VACCINATION & MDA



- most **kittens** are protected by **MDA** in the first weeks of life ➡
  ideally, 1st vaccination administered when MDA are about to waned, but this prediction is very difficult
  - kittens with **poor MDA** ➡ may be vulnerable and able to respond to vaccination at an earlier age
  - kittens with **high MDA** ➡ may be protected and unable to respond to vaccination until ≥12 weeks of age

➡ so, **every kitten is different** and has its own history

WHEN TO START WITH CORE VACCINES?



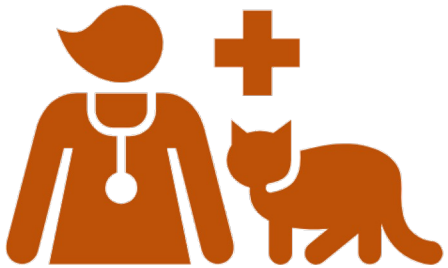
- NO single primary vaccination policy will cover all possible situations

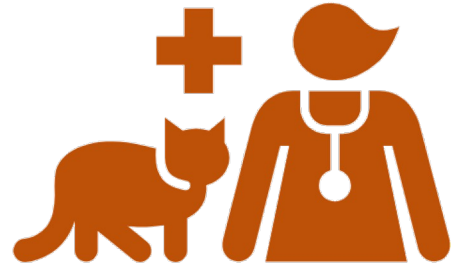
so, the **advice** is to administer

multiple core vaccine doses (MLV)

starting from **6–8 weeks of age** every 3-4 weeks

until 16 weeks or older





KITTEN VACCINATION

AGE	VACCINATION
8 weeks	panleukopenia, herpesvirus and calicivirus infection
12 weeks	panleukopenia, herpesvirus and calicivirus infection + FeLV
16 weeks	panleukopenia, herpesvirus and calicivirus infection + FeLV
or	
9 weeks	panleukopenia, herpesvirus and calicivirus infection
13 weeks	panleukopenia, herpesvirus and calicivirus infection + FeLV
17 weeks	panleukopenia, herpesvirus and calicivirus infection + FeLV

- it is advisable to follow the suggestion of the scientific community ➡ at least 3 vaccinations up to 16 weeks of age (don't stop before!)
- these multiple vaccinations are revaccinations and not booster (MLV vaccines recall themselves)
- in case of emergency ➡ it is possible anticipating the start of vaccinations to 6-7 weeks of age
  - not in all countries are available vaccines for kittens <8 weeks old (ie, ) ➡ off label use

ADULT VACCINATION

AGE	VACCINATION
ZERO risk cats	
1 year*	panleukopenia, herpesvirus and calicivirus infection + FeLV
2 years	===
3 years	===
4 years	panleukopenia, herpesvirus and calicivirus infection
5 years	===
6 years	===
7 years	panleukopenia, herpesvirus and calicivirus infection
… AND SO ON	

*closure of the first vaccinal series

AGE	VACCINATION
LOW-risk cats	
1 year*	panleukopenia, herpesvirus and calicivirus infection + FeLV
2 years	===
3 years	herpesvirus and calicivirus infection + FeLV
4 years	===
5 years	panleukopenia, herpesvirus and calicivirus infection + FeLV
6 years	===
7 years	herpesvirus and calicivirus infection + FeLV
… AND SO ON	

AGE	VACCINATION
HIGH-risk cats	
1 year*	panleukopenia, herpesvirus and calicivirus infection + FeLV
2 years	herpesvirus and calicivirus infection + FeLV
3 years	herpesvirus and calicivirus infection + FeLV
4 years	panleukopenia, herpesvirus and calicivirus infection + FeLV
5 years	herpesvirus and calicivirus infection + FeLV
6 years	herpesvirus and calicivirus infection + FeLV
7 years	panleukopenia, herpesvirus and calicivirus infection + FeLV
… AND SO ON	

IS IT POSSIBLE TO CONTROL PROTECTION ?

- controlling protection is not only important but also essential for the good vaccination practices!

Serological Testing

Since the publication of the 2010 guidelines, one commercial in-practice rapid test for determination of serum antibody to FPV, FCV and FHV-1 has become available. This test has now been validated and applied in a series of published investigations (DiGangi *et al.* 2011, Mende *et al.* 2014) [EB1]. This test kit may be used for the determination of the presence of protective antibody against FPV as there is excellent correlation between the presence of such antibody and resistance to infection (Lappin *et al.* 2002) [EB1]. The FPV test kit is reported to have 89% specificity and 79% sensitivity (Mende *et al.* 2014) or 99% specificity and 49% sensitivity (DiGangi *et al.* 2011) when compared with a haemagglutination inhibition test. A negative test result indicates that a cat has little or no antibody, and that revaccination is recommended. However, some seronegative cats are in fact immune (false-negative) and their revaccination would be unnecessary. In contrast, a positive test result would lead to the conclusion that revaccination is not required.

WSAVA Global Veterinary Community | Vaccination Guidelines Group

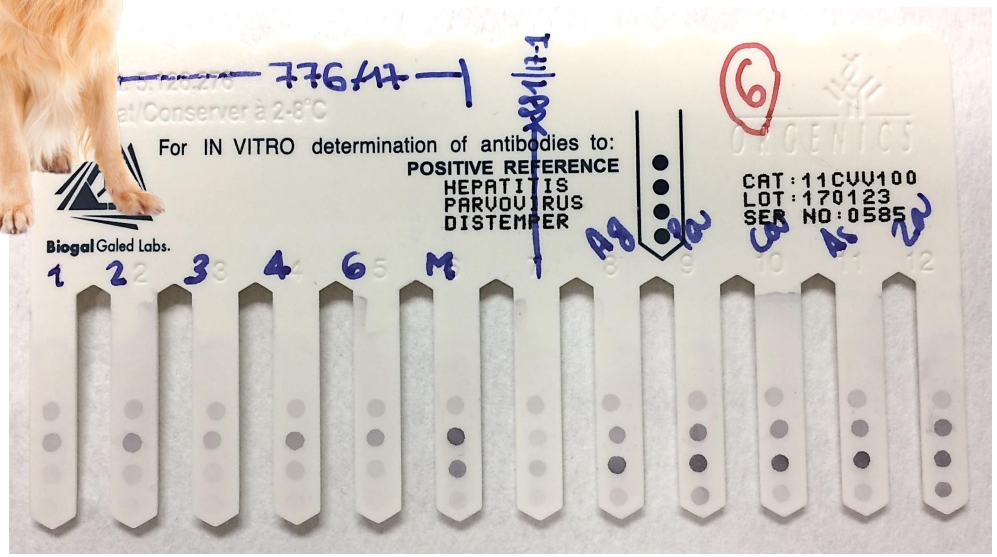
Journal of Small Animal Practice • Vol 57 •

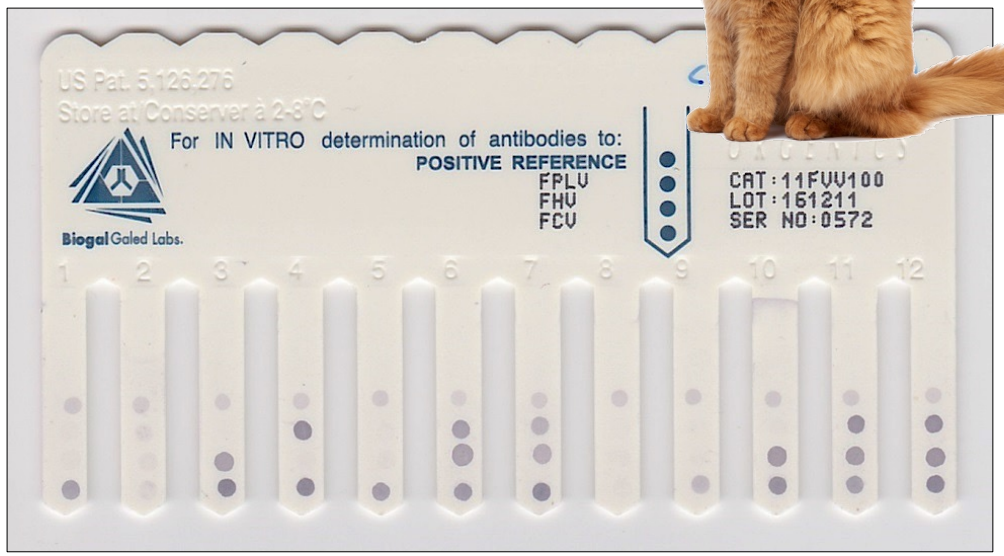
The correlation between circulating serum antibody and protection against FCV and FHV-1 infection is less robust than the presence of adequate local mucosal immunity and cell-mediated immunity, respectively. For that reason, a negative test result for FCV or FHV-1 antibody would not necessarily indicate lack of protection in a particular cat (Lappin *et al.* 2002) [EB1]. These tests can be applied in practice as described above for the dog: for determination of protection of kittens following FPV vaccination, for determination of protection against FPV in adult cats (in order to inform decisions about revaccination) and for use in the shelter situation in the control of outbreaks of FPV infection. It should be emphasized that antibody testing for FIV is used to diagnose disease and is of

- for this purpose ➡ many **in-clinics tests**, but
  - possible only for core vaccines (CPV-2, CDV, CAV-1 / FPV, FHV-1, FCV)

IT IS POSSIBLE TO CONTROL PROTECTION !

- I had started two years before (2014) controlling specific antibody responses in dogs & cats with VACCICheck® (Biogal/Agrolabo)
  - to date (8 years) I tested many pets (owned & stray)
    - about 1,200
    - about 360





FeLV VACCINE: WHO AND WHEN

2020 AAFP Feline Retrovirus Testing and Management Guidelines

Journal of Feline Medicine and Surgery (2020) **22**, 5–30

- vaccinate **only seronegative** cats at risk
- start **vaccinating kittens** with 2 injection 3-4 weeks apart
- administer FeLV **booster vaccination 1 year after** initial vaccine series

do not revaccinate cats with no risk of exposure

- Cats living in a single-cat household with no exposure to other cats
- Cats living in a household with other cats known to be FeLV negative
- Cats with outdoor access to an enclosure only or no outdoor access
- Cats with no exposure to either FeLV-infected cats or cats of unknown FeLV status

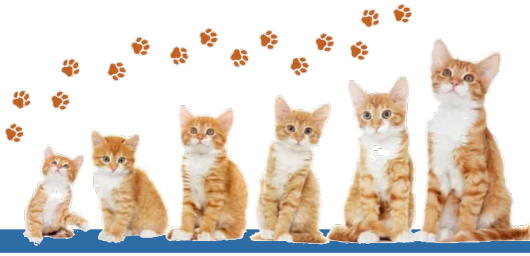
revaccinate every 2 years cats with low risk of exposure

- Cats with no history of inter-cat aggression (eg, previous cat fight bites)
- Cats with limited outdoor access and low possibility of exposure to cats of unknown FeLV status

revaccinate annually cats with high risk of exposure

- Cats with outdoor access
- Cats living with known FeLV-infected cats
- Cats in contact with cats of unknown FeLV status

SENIOR VACCINATION



- difficulty in fighting a new antigen (**PRIMARY response**), but **memory cells** remember a known antigen (**SECONDARY response**)

➡ DON'T STOP VACCINATIONS

as a cat gets older,
but MODULATE them!

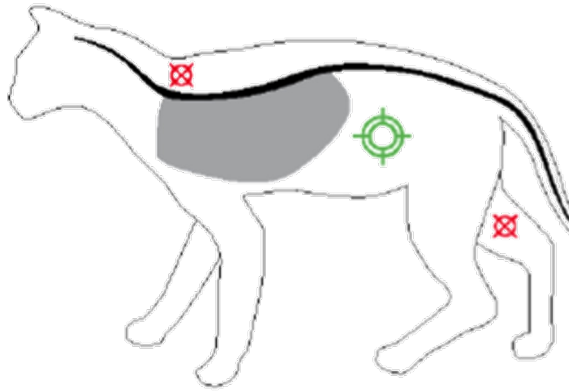
VACCINATION & FISS

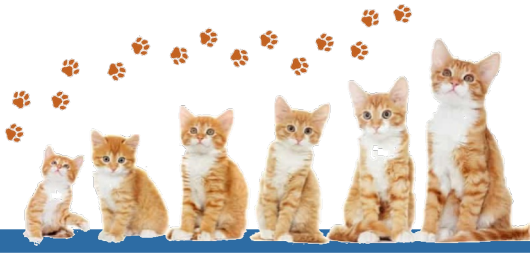
2020 AAHA/AAFP Feline Vaccination Guidelines

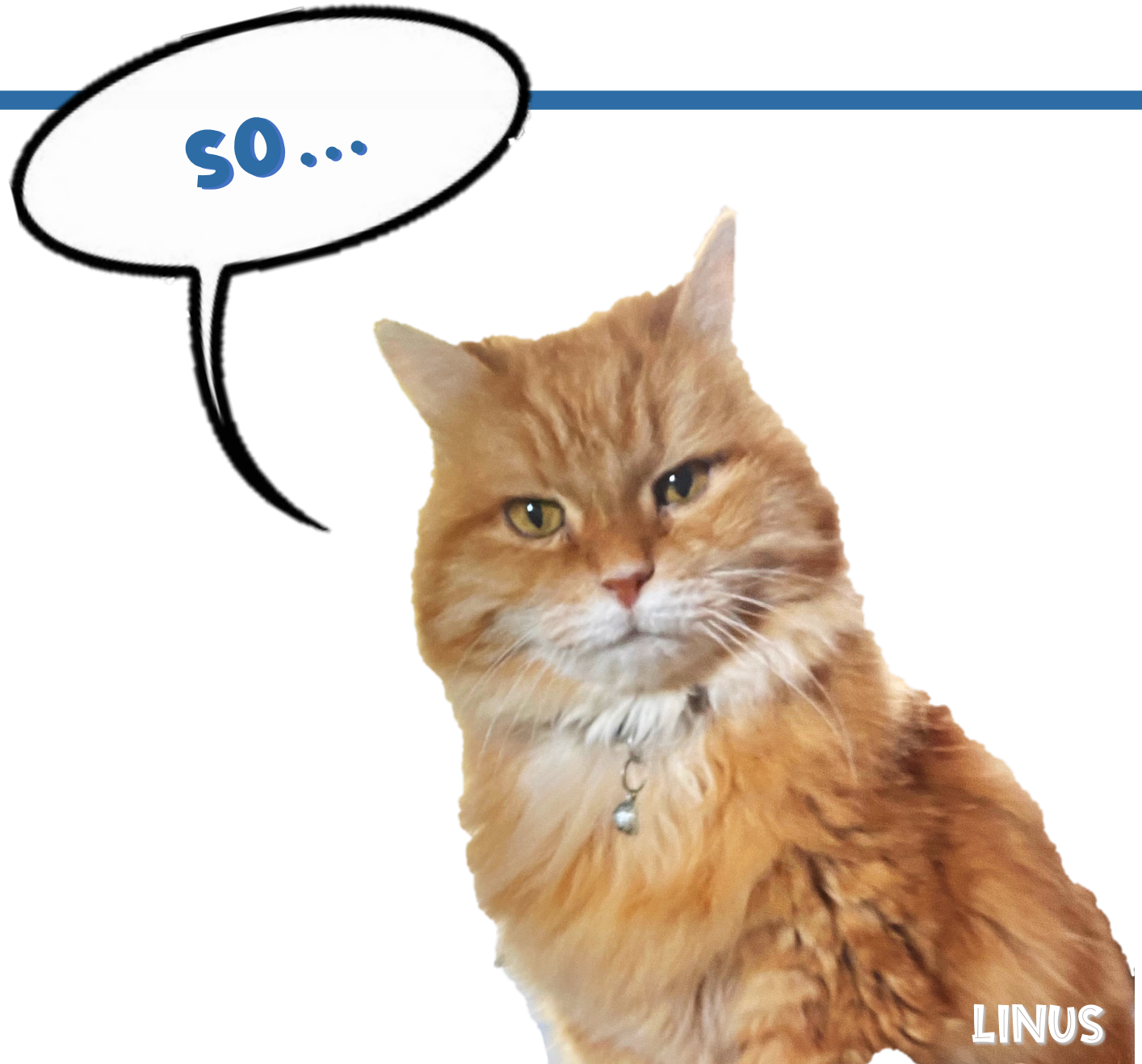
Journal of Feline Medicine and Surgery (2020) **22**, 813–830

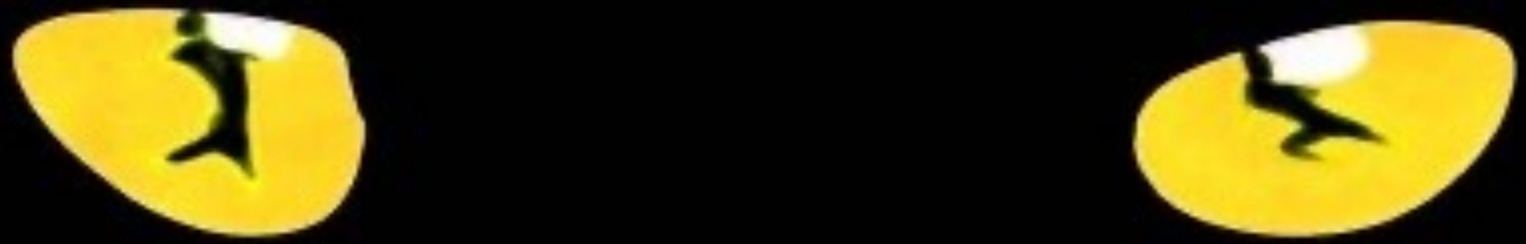
Feline Injection-Site Sarcoma (FISS)

- is largely caused by vaccines (although other materials have been implicated)
- vaccinating in the **interscapular space** ➡ **NO longer recommended**
- **decreasing** vaccine volume ➡ **NOT recommended**
- **distal limb injection** ➡ recommended
  - in case of FISS ➡ amputation facilitated
- **ventral abdominal subcutaneous injection** ➡ recommended
  - in case of FISS ➡ tumour removal possible without amputation, but aggressive tissue removal needed
- **distal tail injection** ➡ recommended
  - in case of FISS ➡ amputation facilitated






SO...
LINUS



KEEP CALM

AND

VACCINATE

CATS