

FALPS (FELINE AUTO-IMMUNE LYMPHOPROLIFERATIVE SYNDROME) IN BRITISH SHORTHAIR CATS & OUTCROSSED BREEDS (MANX, SCOTTISH FOLD & SELKIRK REX)

WHAT IS FALPS?

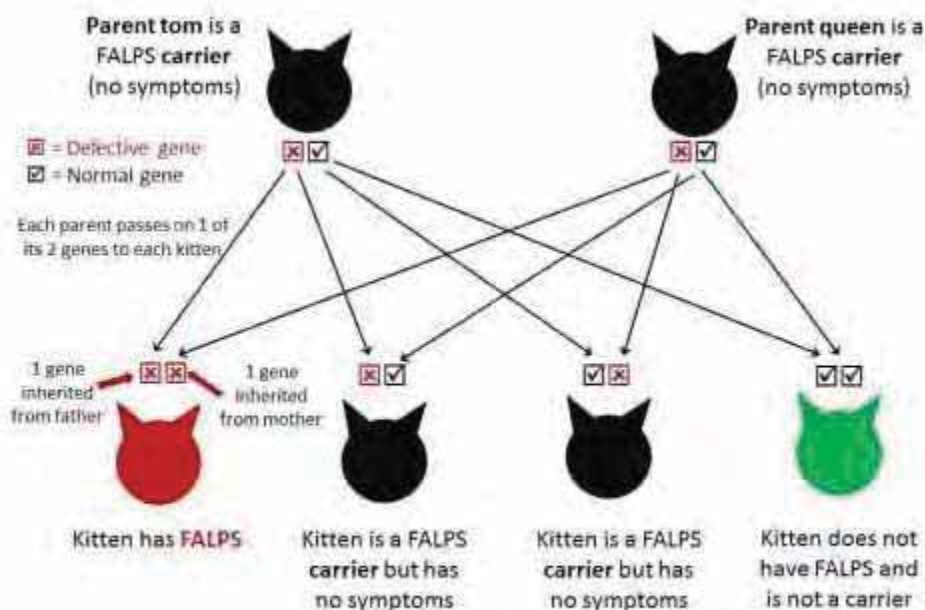
Feline ALPS (FALPS) is an unusual disease first seen in multiple related British shorthair (BSH) kittens in Australia in the 1990s and in New Zealand from 2008.¹ Kittens affected by FALPS are normal at birth but start to show signs of tiredness, reduced growth, anaemia and large lymph nodes (important in the immune system) in the first 2-3 months of life. The disease usually progresses quickly, currently has no effective treatment, and affected kittens often die or require euthanasia shortly after diagnosis. The disease is sometimes misdiagnosed as an unusual form of lymphoma (a type of cancer).

WHAT CAUSES FALPS?

We have recently confirmed that FALPS is an inherited disease due to a defect in one of the genes controlling the proliferation of lymphocytes (a type of white blood cell).² Disease inheritance is recessive - which means that a kitten must inherit 2 copies of the defective gene (1 from each parent) to develop FALPS. Kittens inheriting only 1 copy of the defective gene appear healthy and do not develop FALPS - but will be carriers of FALPS and so can pass the defective gene on to their kittens.

HOW CAN 2 HEALTHY CATS PRODUCE FALPS-AFFECTED KITTENS?

Cats which are carriers of the defective FALPS gene appear healthy, so owners or breeders don't usually know they are carriers. However, when 2 carrier cats mate together, that mating is likely to produce some kittens which develop FALPS as well as some kittens which are carriers. For example, in a mating between 2 carrier cats (see diagram below), 25% of kittens would be expected to develop FALPS, 50% of kittens would be expected to be FALPS carriers (but would themselves appear healthy), and 25% of kittens would be expected to be healthy non-carriers of the disease - although the exact numbers seen in each litter will vary. So, any mating between 2 FALPS carrier cats has a risk of producing both sick (FALPS-affected) and carrier kittens.



Carriers have 1 defective gene and 1 normal gene = ☒☑ A kitten needs 2 defective genes to develop FALPS = ☒☒

HOW CAN I FIND OUT IF MY CAT OR KITTEN IS A FALPS CARRIER?

Any cat which has been the parent of a FALPS-affected kitten should be assumed to be a FALPS carrier. However, a cat that has not previously produced FALPS-affected kittens, is not necessarily a non-carrier. The best way to reliably identify whether cat is a FALPS carrier is have the cat genetically tested - which we can do at Massey University in New Zealand using DNA from cheek swab samples. Owners and breeders can easily collect and send these samples themselves. The current cost of testing is \$50 + GST per sample.

Please contact us if you think you have had had kittens with FALPS, would like to discuss FALPS testing or be sent a testing kit, or would like more information about the disease:
D.Aberdein@massey.ac.nz

WHAT SHOULD I DO IF MY CAT IS A FALPS CARRIER?

Cats identified as FALPS carriers should be de-sexed and not used for breeding. Alternatively, if desexing all carrier cats is not immediately feasible (e.g. in a cattery with a small number of breeding cats), carriers should only be mated to known (i.e. tested) non- carriers, and all kittens from the mating should be tested for FALPS. Kittens tested as non- carriers should then be used for future matings in preference to carriers, which should be de-sexed.

As carriers do not seem to be affected by the disease themselves, they are fine as pets provided they are de-sexed.

REFERENCES

1. Aberdein, D.; Munday, J. S.; Fairley, R. A.; Vernau, W.; Thompson, K. G., A Novel and Likely Inherited Lymphoproliferative Disease in British Shorthair Kittens. *Vet Pathol* **2015**, *52* (6), 1176-82.
2. Aberdein, D.; Munday, J. S.; Gandolfi, B.; Dittmer, K. E.; Malik, R.; Garrick, D. J.; Lyons, L. A.; Lives, C., A FAS- ligand variant associated with autoimmune lymphoproliferative syndrome in cats. *Mamm Genome* **2016**.

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Institute of Veterinary, Animal and Biomedical Sciences Massey University
Palmerston North NEW ZEALAND.

If anyone is interested in the thesis on this disease done by Dr. Dani Aberdin, contact Robbie Walker robbie.walker@internode.on.net or ACF Secretary secretary@acf.asn.au as the file is 6MB.

FALPS - DOCUMENTATION

FELINE CHEEK SWAB COLLECTION - INSTRUCTIONS

You'll need:

1. Double-ended **cotton buds** (also called cotton swabs or Q-tips - just NOT the ones with wooden handles, they reduce DNA viability) or cytological **brushes**
2. Clean and dry **paper envelopes**
3. Disposable **gloves**
4. A **pen** for labelling envelopes
5. A **large envelope** for enclosing and sending all the samples

You've probably taken cheek swabs before, but if not:

1. Wait at least 30 minutes after the cat has eaten or nursed.
2. Sample ONE cat at a time. If samples are to be collected from several cats in the same session, complete steps 3-8 for one cat before sampling the next cat.
For each cat:
3. Open the cat's mouth and vigorously rub and rotate one end of the cotton bud or brush along the inside of the cat's cheek and/or gums up and down 8-10 times for 10 seconds. Aim for the part of the inside cheek or gum under the whisker pad, NOT the back of the mouth.
4. REPEAT step 3 with the other end of the swab so you collect at least 2 samples from the cat.
5. Once you've taken the samples from that cat, wave the swab or brush in the air for 20-30 seconds to air dry. Don't touch the swabbed ends.
6. Put the swab(s) from the cat into a clean dry envelope and seal.
7. Label the envelope with the cat's name (if this is different to the pedigree name, please label with BOTH names).

Then:

8. Change gloves before sampling the next cat (or wash and dry your hands if you're not wearing gloves) - to avoid cross-contamination of samples.

Put all of the individual envelopes containing swabs into a larger envelope and send to:

Liz Burrows / Dr Dani Aberdein IVABS

Tennant Drive
Massey University
Palmerston North NEW ZEALAND 4442

As well as the **samples** and **your contact information** and ideally, also the **cats' pedigrees**, you also need to **include 2 COPIES of these 2 forms with the swabs when you send** (which I've included):

1. The 2017 MPI **import permit**; AND
2. Your **declaration** (as to what you're sending) - you need to **complete** the date, number of swabs sent, and sign this.

One copy of **BOTH of these documents** MUST be **attached to the outside of the package** (so NZ Customs can check it easily), and the other copy of BOTH documents needs to be **inside the package**.



Any questions, please ask: D.Aberdein@massey.ac.nz

FALPS TESTING – SUBMISSION FORM

PLEASE COMPLETE AND ENCLOSE WITH SWABS WHEN SENDING

YOUR DETAILS:

Name:

Cattery (If applicable):

Postal address:

Email address:

SAMPLE DETAILS:

Animal name /ID	Pedigree name (if different)	Breed	Sex	DOB	No. Swabs	Pedigree Included
Total number of samples (cats):						

(If needed)



MASSEY UNIVERSITY
COLLEGE OF SCIENCES
TE WĀHANGA PŪTAIAO

Animal name /ID	Pedigree name (if different)	Breed	Sex	DOB	No. Swabs	Pedigree Included
Total number of samples (cats):						

SEND TO: LIZ BURROWS/DR DANI ABERDEIN IVABS

Tennant Drive Massey University Palmerston North NEW ZEALAND 4442

If sending from outside NZ you also need to include **2 COPIES** of 1. The current **MPI import permit AND 2. Your declaration** (as to what you're sending) - you need to complete the date, number of swabs sent, and sign this. One copy of **BOTH of these documents** MUST be attached to the outside of the package (so NZ Customs can check it easily), and the other copy of BOTH documents needs to be inside the package. **Please email me BEFORE sending.** Any questions, please ask: D.Aberdein@massey.ac.nz



PERMIT TO IMPORT RESTRICTED BIOLOGICAL PRODUCTS OF ANIMAL ORIGIN

This permit is issued under The Biosecurity Act, 1993. Any queries, please contact Animal Imports & Exports Group, MPI, PO Box 2526, Wellington, (Phone 64 4 8940100, Facsimile 64 4 8940733)

Authorising Officer : Lucy Johnston on 29 Jun 2017

for Director General, Ministry for Primary Industries, acting under delegated authority

Permit for : Massey University (Turitea Facility)
Tennet Drive
Palmerston North
New Zealand
Attention : James Connell
j.b.connell@massey.ac.nz

Permit No : 2017065045
Replaces Permit No : 2016060992
Expiry Date : 29 Jun 2018
No of Consignments : Multiple
Import Purpose : Research

End Users :

Client Refs : PN342683

Shipped From : All Countries

Description of Items	Supplier	Quantity	Measure
Animal feed samples (including ground grain)		Unlimited	Units
Animal serum/blood products (including, but not limited to, BSA, FCS, FBS)		Unlimited	Units
Antisera (not commercially manufactured)		Unlimited	Units
Blood (whole or parts) and tissue (including feathers) samples		Unlimited	Units
Bovine Serum Albumin		Unlimited	Units
Bread		Unlimited	Units
Cellular extracts		Unlimited	Units
Cooked meat products (including fish, shellfish, sheep, cattle and poultry) and ready meals (containing dairy & plant material) for product evaluation		Unlimited	Units



Description of Items	Supplier	Quantity	Measure
Digesta and Excreta (including urine, bile and faeces) samples for chemical analysis/radioimmunoassays		Unlimited	Units
Fetal bovine serum	Various	Unlimited	Units
Fish products		Unlimited	Units
Freeze-dried meals		Unlimited	Units
Juice		Unlimited	Units
Monoclonal and polyclonal antibodies (not commercially manufactured)		Unlimited	Units
Non-viable plant material samples		Unlimited	Units
Ovine Serum Albumin		Unlimited	Units
Pet food (including meat meal) for chemical analysis		Unlimited	Units
Processed milk samples (whole or parts including colostrum) for chemical tests and physical analysis		Unlimited	Units
Proteins or enzymes (not commercially manufactured)		Unlimited	Units
Proteins, peptides/polypeptides, amino acids, enzymes, polysaccharides and lipids (not commercially manufactured and packaged)		Unlimited	Units
SPF eggs		Unlimited	Units
Standard mycological broths		Unlimited	Units
Swabs for DNA/RNA/chemical analysis from tissue, bodily fluids, digesta, excreta, plants or the environment		Unlimited	Units
Whole (dead) animals, or parts thereof (including tissue samples), which are unpreserved		Unlimited	Units
Whole almonds (non-viable) and almond oil		Unlimited	Units

Import Health Standard

BIRSPFIC.AUS, 04 Oct 2005, BIR - SPF Chicken Eggs for Laboratory Use from Australia

BIOPRODIC.ALL, 03 Jun 2011, BIO - Biological Products (including samples)



Post Entry Type : Transitional Fac

Standard Reference : 154.02.17 (Standard - Transitional Facilities for Biological Products)

Transitional Facility : Massey University - Albany **Operator :** Massey UNIVERSITY
Eastbourne Rd
Albany
Auckland

Ref : 26269

Standard Reference : 154.02.17 (Standard - Transitional Facilities for Biological Products)

Transitional Facility : Massey University - Turitea **Operator :** Massey UNIVERSITY
Ring Road Massey University Rd
Palmerston North
Palmerston North

Ref : 12025

Standard Reference : 154.02.17 (Standard - Transitional Facilities for Biological Products)

Transitional Facility : Massey University - Wellington **Operator :** Massey UNIVERSITY
Wallace St
Mt Cook
Wellington

Ref : 19336

Special Conditions : You must comply with the import health standard(s) listed in this permit. For further information contact MPI at the top of the permit or via the MPI website;
<http://mpi.govt.nz/law-and-policy/requirements/import-health-standards/>

New (including genetically modified) or unwanted organisms are not permitted entry under this permit.

The import health standard, SPF chicken eggs from Australia, and certification requirements only apply to imported SPF eggs. All other products on this permit do not require certification and may be directed to the nominated transitional facility on arrival.

Plant material imported under this permit is for analysis only.

No samples are to be used for the purposes of microorganism enrichment isolation and/or culture.

On arrival in New Zealand, any fresh plant samples must be given a 100% inspection by the MPI inspector for the presence of pests or diseases.



IMPORTANT INFORMATION FOR PERMIT HOLDERS AND AGENTS

- 1 This permit, and compliance with the provisions of the specific import health standard(s) and/or entry conditions, does not guarantee that the goods you import will be given biosecurity clearance. There are other restrictions in sections 27 and 28 of the Biosecurity Act 1993 which apply to the giving of biosecurity clearance. The Biosecurity Act may be accessed at www.legislation.govt.nz.
- 2 You will need to ensure that the goods you import comply with the provisions of the specific import health standard(s) and/or entry conditions that are applicable. The import health standard may be amended during the course of your permit. Import Management will notify you of any significant changes to the import health standard and will re-issue the permit to accommodate these changes.
- 3 There are a number of other provisions in the Biosecurity Act 1993 which may affect you. If you commit an offence against the Biosecurity Act 1993, heavy penalties under section 157 of the Act might apply.
- 4 Apart from the Biosecurity Act 1993, there are other laws relating to or prohibiting the importation of goods. This permit, and compliance with the provisions of the specific import health standard(s) and/or entry conditions, does not absolve you of the need to comply with these laws.
- 5 Unless specifically identified in 'Description of Items' or 'Special Conditions' of the permit, NO new organisms, including genetically modified organisms, are permitted entry under this permit.
- 6 All cultures must be:
 - clearly labelled with the scientific strain and name
 - consigned in leakproof packaging
 - free from contaminants
- 7 All new organisms must not be opened until received by the nominated containment facility

Date: 2017

Sender:

Address:

AUSTRALIA

Recipient: Liz Burrows / Dr Dani Aberdein
IVABS – Tennant Drive
Massey University
Palmerston North
NEW ZEALAND 4442

email: D.Aberdein@massey.ac.nz

Phone: +64-6-356 9099 x85280 or +027 507 7321

DECLARATION: TISSUE SAMPLES FOR IMPORT INTO NEW ZEALAND – PERMIT 2017065045

This package contains _____ tissue samples (buccal swabs) collected from domestic cats in Australia as described and permitted in the **attached** import permit. The samples are being sent to Massey University for investigational and research use.

I declare that the above information is true and correct to the best of my knowledge.

Signed: _____

Name: _____