PURINA® PRO PLAN®
CALMING CARE SYMPOSIUM 2026
The Gut–Brain Axis in Practice

PURINA®
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symposium

Real-Life Applications: effect of stress related behaviours on welfare
A combined behavioural and nutritional approach

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Austin

GOLDEN RETRIEVER

Sex: Intact male

Age: 2 years (21/04/2023)

Weight: 28 kg

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Austin – Reason for consultation

Austin was presented for evaluation due to behaviours consistent with **persistent stress**

His stress-related behaviours lead to weight loss and prevents proper weight gain

The onset of stress was associated with the persistent presence of unformed faces

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Austin – Case history

Austin lives in a breeding facility and alternates his daily routine between the kennel environment and a family and office setting

He is an active stud dog
mounts only in solitary contexts

Austin is compliant with routine vaccination protocols and parasite prevention treatments

No history of significant past illnesses

He is not currently taking any medications

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Austin – Case history

Austin has a normal sleep pattern
normal exploratory behaviour

He does not destroy or steal objects
engage in pica or coprophagia

No inappropriate elimination has been ever reported

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Austin – Case history

Austin is taken for walks for a total of two hours per day
(morning and afternoon)
both off-leash and on-leash

Austin completed a three-month training program starting at four months

He plays appropriately with other dogs and shows no aggression

He has never displayed aggressive behavior toward people or other dogs

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Austin – Case history

At 10 months of age experienced a significant fear reaction

Suddenly he heard the intense barking of a highly agitated dog housed in a nearby kennel

The other dog repeatedly attempted to escape confinement producing loud rattling noises that contributed to a marked fear response in Austin

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Austin – Case history

Since that episode Austin has begun to show generalized stress-related behaviours both in familiar and unfamiliar situations along with weight loss and persistent diarrhoea

- His stress condition leads to weight loss and prevents proper weight gain

Losing body condition

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Austin – Case history

Owner describes Austin as frequently agitated and reactive

Fearful of loud noises
He pants frequently
Hides
Trembles
Seeks physical contact

He shows environment-dependent mood fluctuations with a marked increase in novel or unfamiliar situations

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Austin – Case history

Freezing behavior in office setting

Austin's entry into the office environment
(previously known to him as a puppy)
he exhibited a marked freezing response
remaining immobile before gradually relaxing

Comparable behavior was observed in other familiar contexts

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Austin – Case history

Austin is more confident when he is with other dogs but always agitated and hyper-excitable

He displays marked startle and fear responses to the sudden arrival of unfamiliar people or by doors slamming

in these situations occasional vocalizations may occur although barking is generally infrequent

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Austin – Nutritional evaluation

Austin is 28 kg

Body condition score, BCS: 3

Since weaning had been fed Pro Plan Sensitive Digestion Medium Puppy

He remained on this diet until around 10–12 months of age when (with the fearful event) he began to exhibit recurrent episodes of diarrhoea and signs of generalized stress-related behaviours

Following the onset of these clinical manifestations Austin was taken for a consultation and underwent an examination by a veterinary nutritionist

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Austin – Nutritional evaluation

A complete clinical examination and a full set of laboratory tests were performed

complete clinical chemistry panel

complete blood count

capillary protein electrophoresis

CHIMICA CLINICA

		intervallo di riferimento min	intervallo di riferimento max
CPK (IU/L):	90	35	200
LDH (IU/L):	238	32	344
AST (IU/L):	54	17	52
ALT (IU/L):	142	19	76
ALP (IU/L):	32	12	134
GGT (IU/L):	6	2	9
Colinesterasi (IU/L):	4005	2480	8962
Bilirubina Tot. (mg/dL):	0.27	0,1	0,3
Glucosio (mg/dL):	98	77	121
Fruttosamine (µmol/L):	300	224	383
Colesterolo (mg/dL):	161	131	332
Trigliceridi (mg/dL):	59	32	114
Urea (mg/dL):	42	18	50
Creatinina (mg/dL):	1.00	0,6	1,4
Amilasi (IU/L):	553	379	1167
Lipasi Totale (IU/L):	60	91	593
Lipasi DGGR (IU/L):	44	30	119
P.T. (g/dL):	5.90	5,1	7,5
Albumina (g/dL):	2.80	2,4	3,7
Globuline (g/dL):	3.10	2,4	4,3
Rapporto A/G:	0.90	0,6	1,3
IgG (mg/dL):	497	178	894
IgM (mg/dL):	73	46	210
Calcio (mg/dL):	10.0	9,1	11,5
Calcio corretto (mg/dL):	10.7	9,9	12,1
Fosforo (mg/dL):	3.6	2,5	5,5
Calcio * Fosforo:	38.3		< 60
Sodio (mEq/L):	146	143	153
Potassio (mEq/L):	5.0	3,9	5,7
Rapporto Na/K:	29.3	> 27	
Cloro (mEq/L):	114	108	119
Cloro corretto (mEq/L):	114.0	106	115
Rapporto Cloro/Fosforo:	31.8		
Bicarbonati (HCO-3) (mEq/L):	17.6	17	24
Acido Lattico (mg/dl):	26.1	9,98	28,51
Divario Anionico:	19.4	15	25
Magnesio (mg/dL):	2.0	1,9	2,5
Osmol. Sier. Misur. (mOsm.):	306.5	297	344
Osmol. Sier. Calc. (mOsm.):	305.1	297	320
Ferro totale (µg/dL):	200	80	214
UIBC (µg/dL):	202	129	406
TIBC (µg/dL):	402	262	529
Saturazione (%):	49.8	18,8	57,8
Ferritina (ng/mL):	217	79	350

Note:

		intervallo di riferimento min	intervallo di riferimento max
Prot. C Reattiva (mg/L):	0.1	0,1	2,8
Aptoglobina (HPT) (mg/dL):	90.3	0,3	142

EMOGRAMMA

		Int. di rif. min	Int. di rif. max
RBC			
RBC (x10⁶/µL):	6.28	5,9	8,7
HGB (g/dL):	14.00	13,9	20,4
Cellular HGB (g/dL):	14.40	13,7	21,2
Hct (%):	46.40	43,2	63,2
MCV (fL):	73.80	65.1	82.1
MCH (pg):	22.40	21,4	25,6
MCHC (g/dL):	30.30	28,8	35,2
CHCM (g/dL):	31.10	27,9	37,4
CH (pg):	22.80	20,8	26,5
CHDW (pg):	2.74	2.5	3,2
RDW (%):	14.30	12,1	15,7
HDW (g/dL):	1.76	1,6	3,1
NRBC /100WBC:	0	0	0
WBC			
WBC (x10³/µL):	6.96	5,6	14,0
WBC corr. (x10³/µL):	6.96	5,6	14,0
Mielociti (%):	0.00	0	0
Metamielociti (%):	0.00	0	0
Neutrofili banda (%):	0.00	0	0
Neutrofili segm. (%):	61.20	42,9	78,0
Linfociti (%):	31.50	12,5	47
Monociti (%):	4.10	1,9	9,6
Eosinofili (%):	2.90	0,7	12,5
Basofili (%):	0.10	0	0,6
LUC (%):	0.20	0	0,6
Mielociti (/µL):	0	0	0
Metamielociti (/µL):	0	0	0
Neutrofili banda (/µL):	0	0	0
Neutrofili segm. (/µL):	4260	3100	10400
Linfociti (/µL):	2192	1100	4300
Monociti (/µL):	285	100	900
Eosinofili (/µL):	202	100	1200
Basofili (/µL):	7	0	100
MPXI:	16.50	LI:	2.85
PLT			
PLT (x10³/µL):	402	110	475
MPV (fL):	10.70	9,9	17,2
PCT (%):	0.43	0,1	0,6
PDW (%):	53.00	37,4	71,2
MPC (g/dL):	18.30	15,5	22,4
PCDW (g/dL):	5.40	3,4	6,5
MPM (pg):	1.76	1,5	2,7
PMDW (pg):	0.67	0,5	1,1
Large PLT (x10³/µL):	5	1,9	25

Note:

PROFILO RETICOLOCITARIO

Reticolociti (%):	0.45	0,2	2,1
Reticolociti (/µL):	28260	11504	147178
L Retic (%):	80.40	45,7	85,0
M Retic (%):	12.50	7,3	26,5
H Retic (%):	7.10	4,9	33,1
L Retic (/µL):	180	64	780,5
M Retic (/µL):	28	11,0	260,0
H Retic (/µL):	16	12,0	228,0
IRF-H:	7.14	4,9	33,3
IRF-M+H:	19.64	14,9	54
MCVg (fL):	73.10	63,8	81,6
MCVm (fL):	73.10	63,6	81,5
MCVr (fL):	82.50	74,6	99,5
CHCMg (g/dL):	31.40	28,1	36,7
CHCMm (g/dL):	31.40	28,1	38,7
CHCMr (g/dL):	29.80	26,1	31,9
CHg (pg):	22.90	20,07	26,0
CHm (pg):	22.90	20,07	26,0
CHr (pg):	24.40	22,0	27,9
CHDWg (pg):	2.75	2,5	3,2
CHDWm (pg):	2.75	2,5	3,2
CHDWr (pg):	2.98	2,6	4,4
RDWg (%):	14.20	11,8	15,9
RDWm (%):	14.20	11,7	15,4
RDWr (%):	15.60	11,8	25,1
HDWg (g/dL):	1.73	1,5	3
HDWm (g/dL):	1.72	1,5	2,9
HDWr (g/dL):	2.99	2,3	6,1
%Micro_g:	0.21	0	0,5
%Micro_m:	0.20	0	0,5
%Micro_r:	0.47	0	4
%Macro_g:	4.55	0,6	15,8
%Macro_m:	4.47	0,4	15,1
%Macro_r:	22.54	16,0	74,1
%Hypo_g:	3.14	0,4	13,6
%Hypo_m:	3.09	0,2	13,0
%Hypo_r:	15.96	20,3	78,1
%Hyper_g:	0.00	0	0,1
%Hyper_m:	0.00	0	0
%Hyper_r:	0.47	0	2,8
%Low CHg:	13.90	1,9	30,5
%Low CHm:	13.90	1,9	30,6
%Low CHr:	6.60	0,8	19,5
%High CHg:	23.10	5,1	63,2
%High CHm:	23.00	4,9	63,4
%High CHr:	46.50	14,4	79,1

Reticol. Punt. (% R Tot):		0,2	2,1
Reticol. Punt. (/µL):			
CRP (%):	0.46	0,2	2,5
Indice reticoloc:	0.46	0,2	2,4
Ret/NRBC:	> 1	> 1	

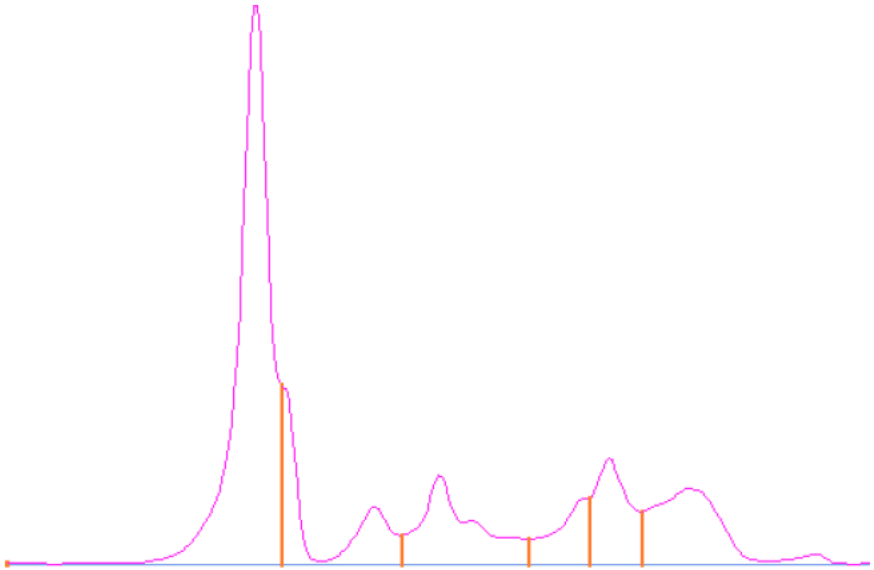
Acantociti	Incl. eri
Acuminociti	Leptoci
Anisocitosi	Macroci
Agglutinazione	Megaloci
Codociti	Microci
Cheratociti	Par. Eri
Cnizociti	Poichiloci
C di Heinz	Policror
C. Howell-Jolly	Punt. Ba
C. Pappen	Rouleau
Cristalli di Hb	Schistoci
Dacriociti	Selenoci
Discociti	Sferoci
Eccentrociti	Stomatoci
Echinociti	Toroci
Elliptociti	Xeroci
Ipocromia	
Linfociti attivati	Gran tossi
Linfociti atipici	Neutr gigan
Linfociti granulari	Mon. attiva
Neutr. Tossici	Macropoli
Corpi di Doehle	Pleocarioci
Schium. Citopl	N ad anell
Vacuol. citopl	LEFT SHIF
Basofilia citopl	RIGHT SHIF
Piastrine attivate	
Piastrine allungate	
Piastrine reticolate	
Macropiastrine	
Inclusi piastrinici	
Aggreg piastrinici	
Microtrombociti	
RBC Frag (x10⁶/µL):	
RBC Ghost (x10⁶/µL):	
Clumps Count	
EMOPARASSITI:	NEG

STIMA PLT:
ADEGUATA: X
INADEGUATA
AUMENTATA

Il Direttore Sanitario
Dott. Ugo Bonfa
Medico Veterinario dell'Ist. Z

Note:

ELETTROFORESI PROTEICA CAPILLARE



		intervallo di riferimento min	intervallo di riferimento max
Albumina (%):	46.80	45,5	66,2
Globuline ALFA (%):	24.20	9,9	19,5
Globuline ALFA1 (%):	11.80	3,8	8
Globuline ALFA2 (%):	12.40	5	12,8
Globuline BETA (%):	15.10	12,8	23,7
Globuline BETA1 (%):	5.80	5.1	14.3
Globuline BETA2 (%):	9.30	9.1	20.5
Globuline GAMMA (%):	13.90	5,1	17,8
Rapporto ALB/GLOB:	0.88		

Austin – Nutritional evaluation

complete urinalysis and urinary chemistry

ESAME DELLE URINE

ESAME CHIMICO		intervallo di riferimento min	max
Colore urine:	GIALLO PAGLIERINO		
Aspetto:	SUBLIMPIDO		
Peso Specifico:	1.010	1.015	1.045
pH:	8.00	5.0	7.5
Glucosio urinario. (mg/dL):	0.00	0	15
Urobilinogeno (mg/dL):	0.2		<=1
Ketoni (mg/dL):	NEG	NEG	NEG
Bilirubina (mg/dL):	NEG		<=1
WBC (/µl):	70	NEG	NEG
Hgb - RBC (/µl):	NEG	NEG	NEG
Proteine Urinarie (mg/dL):	17.65	5	80
Creatinina Ur. (mg/dL):	34.5	80	480
Rapporto PU/CU:	0.51		< 0,5
Note:			

ESAME DEL SEDIMENTO		intervallo di riferimento min	max
RBC (/HPF):	0.00	0	5
WBC (/HPF):	8.00	0	5
Cellule Epiteliali:	RARE	ASSENTI	RARE
Batteri:	MODERATI	NEG	NEG
Lieviti:	NEG	NEG	NEG
Gocciole lipidiche:	ASSENTI	NON COMUNI	
Materiale amorfo:	PRESENTE		
Cristalli (/lpf):	ASSENTI	ASSENTI	ASSENTI
Cilindri (/lpf):	ASSENTI	ASSENTI	ASSENTI

CHIMICA URINARIA

		intervallo di riferimento min	max
Sodio Ur. (mEq/L):	52.0	15	228
Potassio Ur. (mEq/L):	29.0	20	200
Cloro Ur. (mEq/L):	43.0	40	290
Calcio Ur. (mg/dL):	4.7	0,5	10
Fosforo Ur. (mg/dL):	11.8	18	360
Urea Ur. (mg/dL):	1066.4	1500	8500
Creatinina Ur. (mg/dL):	34.5	80	480
Carica Netta Urinaria:	38	-10	195
Osmolalita' Misurata Ur. (mosm/KG):	588	500	2500
Osmolalita' Calcolata Ur. (mosm/KG):	324	570	2520
Divario Osmolale Ur.:	264	0	335
Proteine Urinarie (mg/dL):	17.65	5	80
Rapporto PU/CU:	0.51		< 0,5
Acidi biliari Urinari (µmol/L):	10.35	1	12,50
Acidi Biliari Urinari Norm. Creatinina (x10 ^-3):	3.39	0.2	5.3
Note:			

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Austin – Nutritional evaluation

ELISA test for Giardia was performed and resulted negative
A faecal parasitological examination was also negative
Serum canine trypsin-like immunoreactivity (TLI) was within the normal range
Vitamin B9 (folate) and vitamin B12 levels were within normal limits

ELISA

Elisa per: GIARDIA INTESTINALIS

Risultato: NEGATIVO

ESAME PARASSITOLOGICO DELLE FECI

Risultato: ESAME COPROLOGICO MEDIANTE TECNICA DI FLOTTAZIONE: ESITO NEGATIVO
Note:

TLI CANINO

		intervallo di riferimento	
		min	max
TLI CANINO (µg/L): 41.80		5,2	35

Note:

VITAMINE

	intervallo di riferimento	
	min	max
FOLATI (VITAMINA B9) (µg/L): 7.95	7.7	24.0
VITAMINA B12 (Cobalamina) (ng/L): 490.00	251	908

Note:

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Austin – Nutritional evaluation

At 12 months of age a gastroenteric diet was prescribed consisting of

EN Gastroenteric Purina (wet and dry)
Fortiflora
Honey
flaxseed oil
Purina Pro Plan Relax+

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Austin – Nutritional evaluation

Austin is fed twice daily

His appetite is reported as excessive and his ingestion rate as rapid

Meals are provided on a regular schedule and
no food is left available ad libitum

Normal drinking behavior

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Austin – Nutritional evaluation

The diet was prescribed
to address chronically soft stools
to promote weight gain

1 year
he gained 3 kg
the episodes of diarrhoea have been significantly reduced

no reduction in the symptoms attributable to a persistent state of stress

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Austin – Behaviour assessment and clinical plan

A behavioural assessment was conducted at the University of Milan

During the clinical examination Austin exhibited signs of stress-related behaviours

A behavioural modification was suggested and consisted of
ignoring undesirable behaviours (stress-related behaviours, barking)
reward desirable behaviours
use the more stable dog in potentially critical situations

No medication was prescribed

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Austin – Nutritional plan

The diet with Purina EN was maintained

Fortiflora was maintained

Calming Care was added to the diet

No other feeding recommendation was given

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Austin – Nutritional & behavioural plan

The owner was asked to fill out a behavioural assessment questionnaire before starting the probiotic and every 5 days

At 6 weeks the questionnaire should be completed again to see if there are any changes

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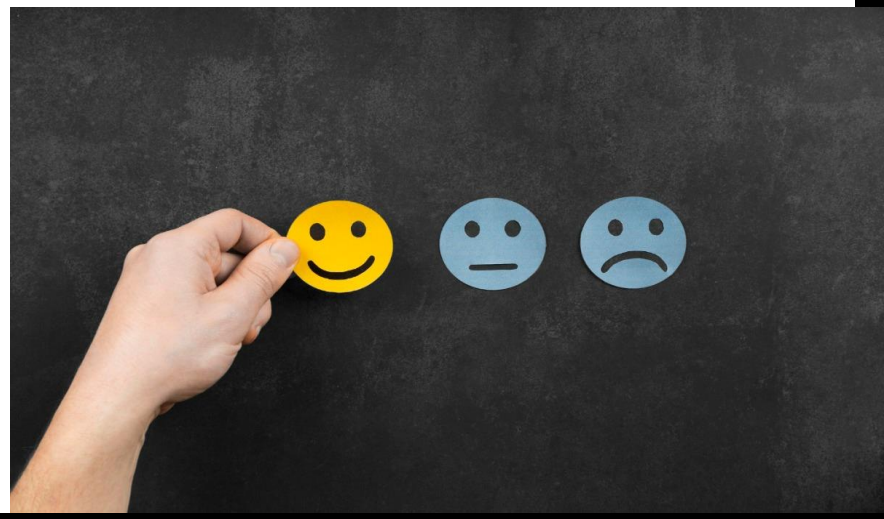
Austin – Nutritional & behavioural plan

Play behaviour
Interdog/Stranger/Owner aggression
Hyperreactivity
Panting
Trembling
Hiding
Attention seeking
Fear of loud noises
Gastrointestinal signs
Mood instability
Repetitive behaviour

Decreased
Stable
Increased



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Austin – follow up

- After six weeks Austin maintained the 3 kg previously gained but also demonstrated an additional 2 kg weight increase since starting Calming Care

- Faecal consistency has remained consistently normal throughout the period

- His overall health status has remained largely unchanged

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Austin – follow up

› A notable improvement in behavioural stability (within the breeding facility in the office environment) has improved both when he is alone and when with other dogs

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Austin – follow up

- His generalized stressed emotional state has shown partial improvement
- When exposed to novel stimuli or to the sudden arrival of individuals Austin presents increased behavioural stability
- does not exhibit agitation
- shows more regular and controlled behavioural responses

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Austin – follow up

- During this period Austin also completed a mating

- Previous matings had resulted in very small litters as his intestinal dysbiosis had negatively affected fertility

- The most recent mating produced six puppies

indicating an improvement in reproductive performance

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Austin – discussion

› In some forms of stressed emotional state
when psychological signs are accompanied by somatic manifestations
the use of a supplement capable of modulating both components
psychological and somatic
represents an ideal management option

› The simultaneous reduction of both stress-related behaviours and gastrointestinal signs further supports the need to address these two dimensions
organic and behavioural
in parallel

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Austin – discussion

- When the product is not a pharmaceutical agent it can be administered easily and safely by the owner

while also offering the additional advantage of being fully compatible with the introduction of pharmacological treatment if needed

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Austin – conclusions

› The patient must always be considered as an integrated organism
in which soma and psyche constitute
a single functional entity

› Behavioural signs should therefore be interpreted within the broader context of the animal's overall physiological condition
and a comprehensive evaluation of the patient
is always required

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PURINA PRO PLAN symposium

UNIVERSITÀ DEGLI STUDI DI MILANO
DIPARTIMENTO DI MEDICINA VETERINARIA
E SCIENZE ANIMALI

il Biancospino

divas

Thank you

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