

MEET PURINA

NUTRITIONAL PIONEERS, TRUSTED PARTNERS
AND PASSIONATE PET LOVERS



Your Pet, Our Passion.®

WE'VE SPENT

120

YEARS

LOOKING FORWARD



“Since the creation of our company over 120 years ago, we have been constantly dedicated to developing industry leading pet foods, and investing in R&D to push the boundaries of pet nutrition forward.

We cannot do this alone and the veterinary profession is an important and valuable partner to us, both in terms of expertise but also sharing the same values of improving the lives of pets worldwide. As we look forward to the future, we remain committed to the veterinary community and we are proud to share our history, beliefs and provide some insights into our nutritional heritage.”

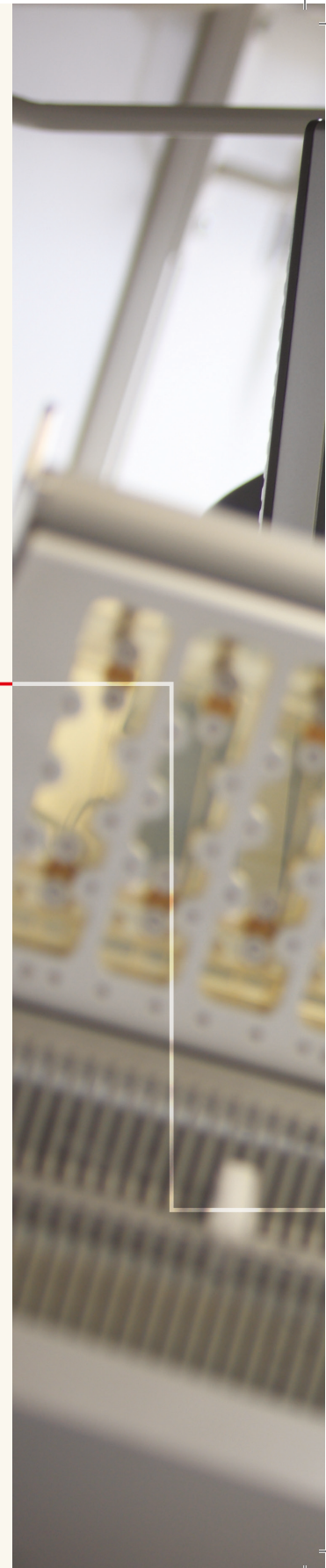
**Bernard Meunier,
Chief Executive Officer,
Nestlé Purina, EMENA**

A NUTRITIONAL HERITAGE OF OVER 120 YEARS FOUNDED ON A DEEP ROOTED PASSION FOR PETS

At Purina, **pets and the people who love them** are our number one priority. We are one of the **world's leading** pet care companies and **a true pioneer** in the pet food industry with roots dating back to the 19th century. Purina was founded on the **three-fold promise of high quality nutrition, proven science and results**. Today we have an extensive portfolio of diets for healthy pets, those with special needs and those requiring veterinary prescribed nutrition. Through our partnerships with respected colleagues and veterinary leaders worldwide, the Purina name is **trusted by veterinary professionals** all over the globe.

At Purina, we have a genuine passion for pets that drives everything we do, and we truly love pets – you will find pets in our homes and sitting by our feet as we work in our offices. We therefore fully understand the bond that exists between pet and owner and passionately dedicate our life's work to driving science forward in understanding pet nutrition and pet behaviour. For Purina scientists and the extensive team involved in driving pet nutrition forward, as pet owners themselves, there can be no stronger motivation than knowing they can make a real difference to the lives of pets and the people who love them.

It is due to our passion for pets that we put Pet Welfare at the forefront of all we do and take that responsibility very seriously.





LIFE ENHANCING NUTRITION SINCE 1890

Nestlé Purina PetCare has a long history with roots in pioneering companies both in USA and Europe, including Albers Bros. Milling Co. (later Carnation), Spillers and Bakers Ltd. (1890) and Robinson-Danforth Commission Co. (1894). A series of mergers spanning 100 years created the business known today as Nestlé Purina PetCare.

Purina was founded by William H. Danforth in St. Louis, USA in 1894, initially producing feed for farm animals. His aim was to build a company that would provide the **best and purest nutrition** for animals in convenient, easy-to-use foods.

In 1921 a new animal feed in a pressed cube format was created – Purina Chow. This innovative technology quickly proved to be a success. In 1926 Purina opened its research centre in Gray Summit, Missouri.

A scientific approach could now be taken to researching the production of animal feed, supported by feeding studies and nutritional tests. In fact, Purina was **the first company** to set up a **research centre dedicated to animal nutrition**.

In 2001 Purina was **acquired by Nestlé** who were already investing in pet food with Friskies, Spillers and Bakers. The merger of these two global pet food companies created a strong and complementary portfolio of products. Much more importantly, the new combined company brought together the **unique scientific knowledge and expertise** from both Nestlé and Purina to create one of the world's **leading scientific authorities** in pet care and wellbeing.



William H. Danforth







UNRIVALLED EXPERTISE ACROSS THE WORLD

With **unique and exceptional research and development capabilities**, the Purina Research and Development (R&D) Network has a rich heritage in nutritional science and is a vital part of the wider Nestlé R&D Network, which comprises a team of **more than 5,000** people. The distinctive expertise of this **network provides the foundation for Purina** to respond to ever-changing pet and consumer needs.

The **core strength** of the Nestlé R&D network is its ability to **share innovations, technologies and high quality standards** between our diverse businesses. Nestlé's **key research platforms**: Metabolic health (weight management/obesity and diabetes); ageing/cognition; gastrointestinal health and microbiota are aligned with Purina research. Through this transfer of knowledge, humans as well as dogs and cats benefit through innovative products improving their health and quality of life.

This process of sharing information also assists technical progress across different types of products. For example, the extrusion process used in pet foods is also used in the manufacture of cereals.

THE PURINA R&D GLOBAL NETWORK

The Purina R&D team is composed of **over 500 scientists**, representing a breadth of disciplines including veterinarians, nutritionists, animal behaviourists, microbiologists, nutritional biochemists and immunologists, and is **dedicated to making discoveries** that improve the lives of cats and dogs worldwide.

The team works within an extensive network of R&D facilities comprising Research, Product Technology and Pet Centres which are located across the globe. **The Nestlé Research Centre (NRC)** is the world's largest private food and nutrition research institute. Based in Lausanne, Switzerland, it is the centre of fundamental scientific research within Nestlé, including pet care. The Product Technology Centre based in St Louis, USA is instrumental in providing information about the nutritional content of

food in relation to a pet's needs and assessing the diet's palatability and digestibility. This is also the centre where engineers and production experts translate scientific ideas into real products.

In the **Purina Research and Development Centres**, scientists drive the innovative science behind all our products, testing new concepts through feeding studies with cats and dogs. These nutrition studies include palatability, digestibility and waste management trials.

Purina is committed to innovation and consistent delivery of high-quality nutrition. Our scientists continuously explore new ways to develop innovative products and make important advances in pet health and well-being.

And our R&D efforts do not stop with innovative nutrition. With teams of experts in manufacturing, engineering and process technology, and scientists with expertise in palatability, we continuously invest in new technologies and effective proprietary processes to manufacture pet foods that are leading-edge in nutrition, palatability, quality and safety for dogs and cats. Years of research have resulted in **over 2,500 granted and pending patents worldwide**.



Today we have R&D Centres in the following locations:

North America:

St. Louis and
St. Joseph, Missouri

China:

Beijing

Europe:

Amiens, France and
Lausanne, Switzerland



Latin America:

Altinopolis, Sauce Viejo

Australia:

Blayney

*“Our global network in combination with our partnerships with external research institutes and universities gives us a **unique network of scientific innovators worldwide** who are working to discover **the next advancements in pet nutrition, health, and wellness.**”*



**Dan Smith, Vice-President
and Global Head of R&D,
Nestlé Purina**

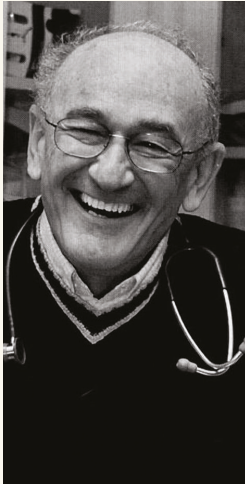
PURINA'S GLOBAL PARTNERSHIPS

Veterinary collaborations we're proud of.

Additional to the vast number of veterinarians and nutritionists in our own global team, Purina recognises the significant benefits of collaborating externally with leading scientists in their chosen field. We **are proud to support and join forces** with **world leaders in veterinary nutrition** to produce top quality peer-reviewed research allowing us to not only produce products containing the latest scientific innovations to support pet health but also make important contributions to veterinary science.

Purina has over **100 global partnerships** with external institutions such as leading universities, research centres, and international veterinary societies. The value of such partnerships is two-fold: **we discover new opportunities** and ideas for innovation and **we can make important contributions** to the scientific world.

Over the past decades Purina has published acclaimed peer reviewed publications in a number of prominent journals (e.g. Journal of Nutrition, British Journal of Nutrition, Journal of Veterinary Internal Medicine, Journal of American Veterinary Medical Association, American Journal of Veterinary Research etc.) based on both internal studies as well as cutting-edge collaborations with world renowned veterinary surgeons, nutritionists and scientists.



*“My experience with Purina extends back several decades. Initially, I participated in the clinical testing of several of the speciality diets formulated by Purina scientists. I became aware of Purina’s commitment to develop innovative products of high quality while recognising food safety as an integral part of their goal. Purina’s commitment to rigorous product development is tied to their concern for corporate social responsibility. In creating shared value, I continue to see **scientific exploration** regarding animal nutrition and **advancing the basic sciences and animal welfare** as part of their culture. Purina people and corporate governance support non-veterinary concerns such as clean water, rural development and healthy nutrition. These functions ensure a positive attitude towards environmental sustainability. My involvement with Purina has included participation in product studies, association with scientific leaders working to improve nutritional knowledge and working with students as they consider their options within the profession. In developing the various editions of the **Textbook of Veterinary Internal Medicine** we have been able to create sections on nutrition that embrace the entire spectrum of worthy nutritional scientists. I remain enthusiastic about being **associated with a company that delivers superior performance and continues to make a distinctive impact on the community.**”*

Steve Ettinger DVM

Textbook Editor, Practicing DVM, and Purina Fellow in Veterinary Medicine



*“I first worked with Purina PetCare on a research project in 2004. I was immediately impressed with the **scientific integrity and quality of the research and development teams** as well as those in veterinary services. I know of no other company as willing to provide research funds to **support quality clinical research**. In addition to the commitment to quality control, Purina PetCare obviously supports clinical research to use in the marketing of their products. Through clinical research funded by Purina PetCare we have been able to help innumerable animals via publications and the sale of their proven products.”*

Michael R. Lappin, DVM, PhD, DACVIM

Assistant Department Head for Research, The Kenneth W. Smith Professor in Small Animal Clinical Veterinary Medicine, Department of Clinical Sciences, Veterinary Medical Center, Colorado State University College of Veterinary Medicine and Biomedical Sciences, USA



*“My collaborative endeavours with Purina PetCare span over 20 years. During this period, I have witnessed a pet food company that embodies **innovation, integrity, professionalism, and transparency**. There is no other pet food company on the planet that rivals Purina’s outreach and philanthropic support of student and resident training programmes, animal shelters, veterinary conferences, sports medicine and rehabilitation facilities, the creation of diet kitchens in universities, and funding of clinical research projects. Purina continues to blaze the trail being **the first pet food company to market a probiotic for dogs and cats and the first pet food company to develop a hydrolysed veterinary diet for dogs**. Of equal importance, Purina’s pro-activeness in engaging a veterinary advisory board consisting of veterinary practitioners and academicians in their respective specialisms has forged an indelible **partnership of trust, transparency, and cutting-edge advances**, helping Purina to raise the bar even higher.”*

Prof Stan Marks, BVSc, PhD, Diplomate ACVIM (Internal Medicine, Oncology), Diplomate ACVN,

Professor of Small Animal Medicine, University of California, Davis, School of Veterinary Medicine, USA





PURINA'S COMMITMENT TO THE VETERINARY PROFESSION

Over the years we have **supported the veterinary profession** worldwide, and we take this commitment very seriously. We fund a range of professional development opportunities for veterinary students including grants and scholarships. And what's more, we work with a **wealth of academic partners** by providing funding for case studies, clinical efficacy studies and fundamental nutritional research.

We also **have long-term partnerships with professional veterinary organisations** on national and international levels. We are proud of providing active support and contributing to knowledge dissemination and network building through these important scientific meetings.

ECVIM & ESCG

Our affiliation with ECVIM-CA, the (European College Of Veterinary Internal Medicine – Companion Animals) and the ESCG (European Society of Comparative Gastroenterology) unites veterinarians with a specific interest in gastroenterology, a key research platform for Purina. Integrated into the annual ECVIM-CA congress, the ESCG has presentations on **gastroenterology from world renowned experts**.

To acknowledge ground-breaking research in the field, Purina in collaboration with ESCG are proud to award the best oral presentation with an annual prize.

*“Purina has sponsored ESCG’s programme stream at our congress for many years now, which has enabled the society to invite leaders in gastroenterology research to speak and educate the **next generation of veterinary internal medicine specialists**.”*

It is also especially rewarding having the opportunity to award a cash prize to an ESCG member in training for an excellent research project, which would not be possible without the generous sponsorship from Purina. It is through such initiatives that the cross-talk between companies interested in GI research and academics is being kept alive and we are very grateful for Purina’s support to our society.”



Karin Allenspach,
Dr.med.vet. FVH,
DECVIM-CA, PhD, FHEA
President, ESCG

ESVCN

The European College of Veterinary and Comparative Nutrition (ECVCN) and its sister organisation, the European Society of Veterinary and Comparative Nutrition (ESVCN), support the quality of care of all animals across Europe by driving competency in the critical field of Veterinary Nutrition. Purina is a major sponsor of the college and society, along with their annual congress which brings together **world leaders from the field of Veterinary Nutrition**. Purina’s contribution to these groups helps the College in the training of residents and future diplomats, and in the organisation of their annual congress.

“The European Society of Veterinary and Comparative Nutrition strongly appreciates Purina as a major sponsor, because it allows the society to train young researchers in the basics of nutrition, yet with an eye on the demands from practice.”

*The yearly scientific congress is the main communication forum of ESVCN, and the contribution of Purina gives the opportunity to keep registration fees low, hence allowing **all new talents to participate and contribute**. Networking with other scientific societies such as the American counterpart AAVN is made possible through sponsorship agreements, therefore stimulating the nutrition research community around the globe.”*



Prof. Geert Janssens,
President, ESVCN

ISFM

The International Society of Feline Medicine (ISFM) is the veterinary division of the charity International Cat Care. It was established more than 50 years ago to help improve the health and welfare of pet cats globally. International Cat Care operates in three main spheres and provides:

- Education and resources to veterinary surgeons, nurses and technicians to improve the veterinary care of cats
- Help, support and advice to all who work with unowned cats
- Information and advice on the care and welfare of pet cats to owners, cat carers, and cat professionals

“ISFM has been working closely with Purina for a number of years and just two of the many areas the organisations have collaborated on are worth highlighting:

*Firstly, Purina has generously supported the ISFM Veterinary Student Membership programme. **Reaching a new generation of vets** with the latest information on the care of cats represents a unique and vital opportunity. Secondly, Purina has been the sole sponsor of the **ISFM Cat Friendly Clinic programme** throughout Europe. This is an accreditation programme that was designed to help veterinary clinics become more cat-orientated and cat-friendly. In Europe, Purina have played a key role in helping to actively promote this important programme, encouraging clinics to participate in it. This is an example of a programme that crosses the bridge between the veterinary profession and the cat owner and has an important impact on both. These are just two examples of the way in which **Purina and ISFM work together** to provide vital support to the veterinary profession in Europe and beyond. ISFM is deeply grateful to Purina for this support and for their ongoing commitment to partner with ISFM in improving the lives of cats.”*



Dr. Andy Sparks,
Veterinary Director,
International Cat Care



WSAVA

Purina partners with the **World Small Animal Veterinary Association** (WSAVA) on a number of global projects to support the veterinary profession. As part of a corporate alliance within WSAVA, Purina has provided funding for the development of the Global Nutrition Committee (GNC) which **provides continuing education** to practising veterinarians as part of the annual WSAVA meeting.

Purina has played an integral part in the development of the GNC **Global Nutrition Guidelines**. The goal of these guidelines is to help the veterinary healthcare team and pet owners ensure that dogs and cats are on an **optimal nutrition plan** tailored to the needs of the individual dog or cat. These guidelines are now available as a part of the GNC toolkit for practising veterinarians. Available in six languages and endorsed by 16 member associations, they have been published in over 15 journals (www.wsava.org/nutrition-toolkit).

In addition to this, Purina is **part of the One Health Alliance** and an integral pillar for the continuing education programme in developing countries.

Purina is dedicated to giving veterinary health care professionals the tools they need to provide state of the art veterinary care to their patients and clients.

SUPPORT FOR THE SCIENTIFIC WORLD

Purina is a strong supporter of veterinary education. Over the past 50 years, we have hosted and organised many of our own global veterinary conferences.

Since the **1960's** the **Purina Small Animal Symposium** brought together veterinarians from around the world for professional continuing education.





This conference has now evolved to become the **Purina Companion Animal Nutrition (CAN) Summit**. Similar to the Nutrition Forum, this conference features **state-of-the art nutrition information and emerging research**, and reaches an audience of veterinary specialists and veterinary nutritionists from around the world. The conference is designed to **promote learning and encourage networking** and idea exchange amongst this highly influential and eminent group.

During the **1990's and 2000's**, Purina hosted the **Purina Nutrition Forum**, i.e. an annual scientific meeting held each year in St. Louis, USA. This global conference was regarded as **one of the best scientific meetings** in veterinary nutrition, as indicated by annual feedback from attendees.

 Nestlé PURINA
Companion
Animal
Nutrition Summit

The Gastrointestinal Tract in Health and Disease



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PILLARS OF RESEARCH

Purina's research in small animal nutrition has led to **many significant innovative** discoveries. Scientists working across a number of disciplines have achieved breakthroughs that have become **pillars of research** that help define and **shape Purina products** and, in many instances, have **redefined industry standards**.

GASTROINTESTINAL HEALTH

With a focus on defining optimal nutritional solutions to promote digestive health. Examples of important discoveries include:

PREBIOTICS:

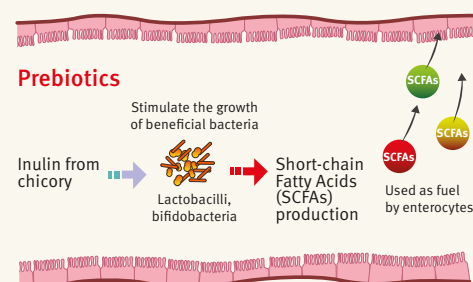
Prebiotics by definition stimulate selectively the growth of beneficial bacteria (e.g. lactobacillus and bifidobacteria) in the large intestine of pets, and ultimately help to balance intestinal microflora. In the healthy gut, a balance between the antagonistic and synergistic activities between bacteria is normal. However, this balance can easily be upset by a variety of factors from stress to gastrointestinal disease. Shifts in microbial population can result in clinical or subclinical changes in the gut, including shedding of pathogenic bacteria and decreased function of the protective intestinal barrier. Purina research has demonstrated that chicory root containing inulin, a fermentable polysaccharide that functions as a prebiotic, provides a substrate for beneficial microflora growth at the expense of some pathogenic bacteria e.g. clostridia. (Czarnecki-Maulden, 2001; Martineau and Laflamme, 2002).

Purina scientists also discovered that chicory helps increase calcium absorption in dogs by positively

affecting the gastrointestinal environment (Czarnecki-Maulden and Russell, 2000; Czarnecki-Maulden *et al.*, 2002; Patil *et al.*, 2001). Research from these studies has led to patents on the use of chicory in pet food.

HYPOALLERGENIC DIETS:

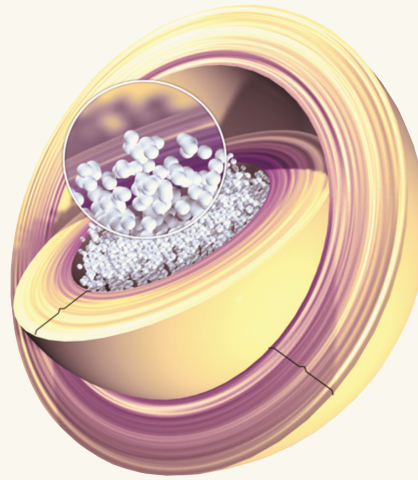
Addressing adverse food reactions in dogs, Purina introduced a patented hypoallergenic soy protein diet. Adverse food reactions can occur when protein antigens infiltrate a dog's gut and cause an immune-based response. Using a molecular modification process, Purina hydrolysed and purified soy protein, thus creating a highly concentrated, quality protein of reduced molecular weight. Hydrolysed soy protein was tested in vitro with canine anti-soy specific IgG and did not show binding between antibody and antigen, demonstrating the efficacy of the hydrolysed protein source even with dogs allergic to soy. This hydrolysed diet has been shown to be effective in managing canine inflammatory bowel disease (Marks and Laflamme, 2002).



PROBIOTICS:

It's widely known that the microbiota – the microbial communities present at intestinal mucosal surfaces and particularly the intestinal epithelium – influences host physiology and overall health status. Bacterial quantity, diversity and metabolic activity all play a crucial role in gut integrity and function, as well as immune function. Together, the microbiota, gut barrier and host immune system constitute the major components of host defence. Supporting these systems and/or maintaining homeostasis is therefore key to preventing or reducing infections and disease.

The balance of the microbiota can be affected by many factors among which environment (hygiene), natural stressors, antibiotic treatment and feeding are particularly important. Diarrhoea is a leading cause of morbidity in pets and a very important challenge for veterinarians.



Nestlé scientists have pioneered research in the field of probiotics. Learning how probiotics can be beneficial to digestive health in humans has led to many ground-breaking products, such as probiotic infant formulas, nutritional drinks for children and yogurt for adults. Nestlé research in turn has helped Purina scientists determine how probiotics can support digestive health in dogs and cats, where Purina is at the forefront.

A multidisciplinary team of scientists from Nestlé and Purina, in collaboration with industrial partners and distinguished academic laboratories and veterinarians, has conducted a series of studies that led to the development of a product containing the probiotic *Enterococcus faecium* SF68®* (4b1705) – a probiotic strain exclusive to Purina. The studies testing *E. faecium* SF68® (4b1705) in pets confirmed its safety in cats and dogs, its survival in the gut and its effectiveness in the management of diarrhoea.

Moreover, *in vitro* studies, as well as intervention studies in dogs and cats, have shown that the strain interferes with pathogen growth and adhesion to gut epithelium, contributes to the restoration of the intestinal microbial balance and enhances immune competence. The strain is also able, under antibiotic pressure (eg ampicillin), to help other beneficial bacteria species (eg *Lactobacillus*) to survive.

Extensive clinical data on this unique strain of *E. faecium* SF68® identified significant health benefits. These included normalising faecal quality in puppies, kittens and elderly pets and improving microflora balance and diversity (Benyacoub *et al.*, 2003; Bybee *et al.*, 2012); helping improve immune function in cats (Lappin *et al.*, 2009; Veir *et al.*, 2007); helping significantly decrease flatulence in dogs (Waldron *et al.*, 2012); helping stimulate the immune system of pets with an increase in the production of intestinal IgA, and enhancing the response to vaccination.

“Thanks to the multifunctional expertise of Nestlé and Purina, it was possible to achieve the production of a viable strain on an industrial scale and throughout down-stream processing, including drying, food manufacturing and long term storage.”

Together, the scientific and technology advances made were instrumental in developing FortiFlora®, a probiotic supplement for dogs and cats with E. faecium SF68® (4b1705) as an important innovation in the field of companion animal nutrition.”



Jalil Benyacoub, PhD

Immunology Group
Leader, Nutrition
& Health Research,
Nestlé Research Center,
Lausanne, Switzerland



Gail Czarnecki-Maulden, PhD

Senior Expert
Nutritionist, Nestlé
Research Center,
St. Louis, USA

*SF68® owned by Cerbios-Pharma S.A, Barbengo, Switzerland

WEIGHT MANAGEMENT

CALORIC RESTRICTION AND LONGEVITY:

Purina was the first company to prove the importance of maintaining dogs throughout their lives in a lean body condition with the completion of the first ever canine life span diet restriction study. This 14 year longevity study remains the longest ever mammalian study and is quoted in both human and pet scientific literature as being the most effective to demonstrate the long-term benefits of caloric restriction.

When maintained in lean body condition, the median life span of Labrador Retrievers was extended by 15% or nearly two years compared to the control group. Additionally, the age when 50% of the dogs required treatment for a chronic health condition (such as osteoarthritis) improved to 12 years among the lean body condition dogs, compared to 9.9 years for the control group (Greeley *et al.*, 1996; 2006; Kealy *et al.*, 1997; 2000; 2002; Lawler *et al.*, 2008; Smith *et al.*, 2006;). Amongst the numerous benefits of caloric restriction, dogs also exhibited higher insulin sensitivity during ageing and a better modulation of immune capacities.

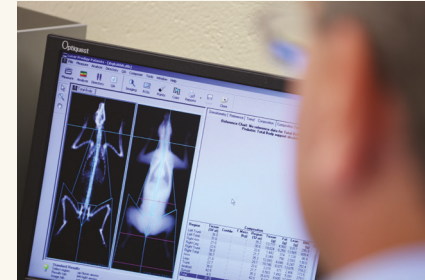
Numerous metabolic processes are stimulated by the cellular adaptation to diet restriction and Purina researchers explored the diet restriction-related differences using metabonomics technology (using $^1\text{H-NMR}$ -based urine metabolite dynamics) which identified that calorie-restricted dogs had reduced energy expenditure, demonstrated a shift in protein, carbohydrate and fatty acid pathways and a change in gut microflora metabolism (Wang *et al.*, 2007).

THE PURINA BODY CONDITION SCORE:

This tool, designed to help assess the body condition of pets and their potential obesity, was developed by Purina scientists and subsequently validated by independent studies, and is used globally today not only in scientific studies but as a useful clinical tool in daily small animal practice (Laflamme *et al.*, 1997a,b).

HIGH PROTEIN FORMULAS FOR WEIGHT MANAGEMENT:

Purina scientists were the first to demonstrate that an increased dietary protein level, combined with a higher protein to calorie ratio, not only stimulates fat loss but also preserves lean body mass during weight loss compared to a control diet of a lower protein level.



Preservation of lean body mass, together with a gradual weight programme, reduces the risk of rebound weight gain. (Laflamme and Hannah, 2005).

Research undertaken by Purina has also shown that high protein improves insulin sensitivity in obese cats undergoing weight loss. Obesity is a significant risk factor in the development of feline diabetes (Hoenig *et al.*, 2007).

“Since its introduction, the Purina BCS system has proven to be a useful tool in numerous weight loss and management studies. Our research has confirmed the value of gradual weight loss in dogs to prevent weight rebound, and the value of increasing dietary protein for weight loss diets for both cats and dogs in order to preserve lean body mass and enhance loss of excess body fat.”



Dottie Laflamme, DVM, PhD, DAVCN,
Senior Research Scientist,
Nestlé Purina



HEALTHY AGEING

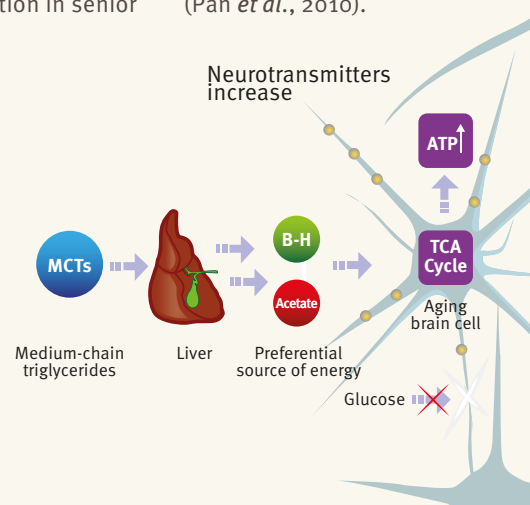
COGNITIVE HEALTH:

This is an important area of research for Purina. One of the biggest and most impactful problems dogs face with age is a decline in cognitive function. In dogs, glucose is the preferred energy source of the brain. Glucose plays an essential role in normal brain functions such as memory, learning, decision making and other executive functions. As dogs age, their brains don't use glucose as efficiently meaning that their brain is essentially starving. This leads to impairments in memory, learning, awareness, perception and decision making.

The Purina team of scientists wanted to develop a solution to address this. If an alternative energy source could be provided to the brain, it would be able to help improve cognition in senior

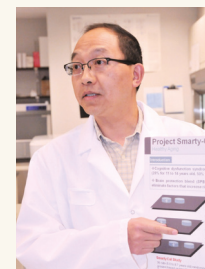
dogs. Studies have shown that medium chain triglycerides (MCTs) in the diet can increase brain levels of metabolites which serve as an alternative energy source. MCTs are converted to beta-hydroxybutyrate (β HB) and acetoacetate (also called ketone bodies) in the liver and to a lesser extent by astrocytes in the brain.

These metabolites can be used by neurons as an alternative energy source to alleviate the deficit in glucose metabolism. In a ground breaking study our scientists supplemented a senior dog's diet with MCTs and demonstrated improvements in cognitive function resulting in improvements in memory, increased attention and alertness, better learning ability and stronger ability to adapt and cope with changes. (Pan *et al.*, 2010).



This patented innovation with MCTs (US 2010144875 and EP 1928552) is unique to Purina. Since its launch in Europe, veterinarians have reported very positive results in senior dogs who are fed PRO PLAN® Adult 7+, diet formulated for older dogs containing 'AntiAge', a nutrient blend with MCTs. Following Purina's ground breaking work on the benefits of MCTs to improve cognitive function in senior dogs, Nestlé now collaborates with a US company who have developed a medicated food containing MCTs which is currently used by over 30,000 sufferers of mild-to moderate Alzheimer's disease in the US.

"We focused on MCTs for the dog because they are easy to digest and are converted by the liver into an alternative brain energy source, ketones. Ketones are used very efficiently by the brain of senior dogs, off-setting the impairment in glucose metabolism. The results were convincing."



Dr. Gary Pan,
Senior Research
Nutritionist,
Nestlé Purina

FELINE AGEING:

Purina scientists also demonstrated that ageing cats have a **decreased ability to digest fat** and as a result a reduced capacity to absorb fat-soluble vitamins such as vitamin E. This results in both a loss of body condition ('skinny old cat syndrome') and a reduction in their antioxidant capacity.

Purina scientists proved that a **patented nutritional blend (LONGEVIS®)** composed of a **proprietary** combination of prebiotics (chicory root), omega 6 and 3 fatty acids, vitamin E and beta-carotene could **increase the life span of healthy elderly cats by one year on average** and improve their quality of life.

The senior cats fed LONGEVIS® also demonstrated higher haematocrit levels, higher bone density, increased skin fold thickness, higher serum vitamin E and better weight maintenance than cats fed the same food supplemented with antioxidants alone (Cupp *et al.*, 2006; Cupp *et al.*, 2008). This innovation is patented. (EP 1 637 041 B 1).

FLUTD (FELINE LOWER URINARY TRACT DISEASE):

As FLUTD is a major health problem in cats, this is a key research for Purina scientists who are focused on **identifying the latest and most advanced technologies to nutritionally maintain and improve urinary tract health.**

A urine pH in healthy cats between 6.3 and 6.6 helps promote urinary tract health and prevent struvite urolith formation. Additionally, increased urine volume and urine dilution can help reduce the risk of calcium oxalate recurrence as well as other types of FLUTD. Purina was **the first pet food company to introduce the combined methodology of using both Relative Super-Saturation (RSS) and Activity Product Ratio (APR)** as an assessment of dissolution and prevention of urolith formation for their diets.

These *in vitro* techniques can predict the likelihood of crystal formation in the cat's urine and thus help evaluate the impact of a diet on urinary crystals and dissolution of stones.

RSS values evaluate the urine mineral saturation for a given crystal compared to standard urine composition. APR not only takes into account the mineral saturation, like RSS, but also evaluates the impact of **urine growth promoters and inhibitors of a given crystal.** This dynamic parameter is **more representative of the *in vivo* situation** and is typically used when assessing human urinary health.





HEALTHY EARLY DEVELOPMENT

The growth phase of a dog or cat's life is crucial in terms of setting the platform for a healthy life, especially when the puppy and kitten's immune system is developing. **Food has a direct impact on immunity** – both positive and negative (as an immunostimulant or as allergen) and **immunonutrition** is the study of the interaction between a pet's immune system and its diet. Our research focuses on finding nutritional solutions which support the pet's immune system without over-stimulating it, whilst taking into account the specificity of this life stage. Purina scientists were **the first to study and demonstrate the benefits of including colostrum in the diet.**

The research identified that dogs and cats fed a diet supplemented with colostrum had **strong, long-lasting local and systemic immunity**. Results also demonstrated that colostrum **promotes diversity and stability of gut microorganisms**, reducing the risk of stress-related diarrhoea and improving overall gut health. It also enhances specific immune response to vaccination. (Ebenezer Satyaraj *et al.* 2013)

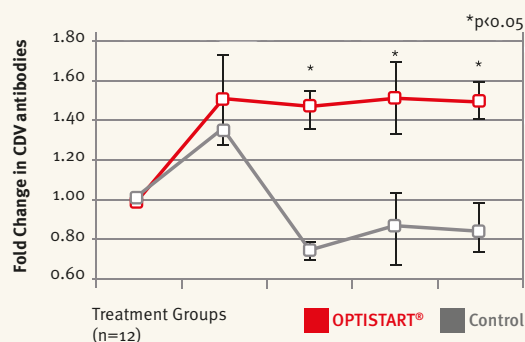
“Colostrum is added to our PRO PLAN® puppy and kitten formulas to help support immune and digestive health-benefits that pet owners are interested in.”



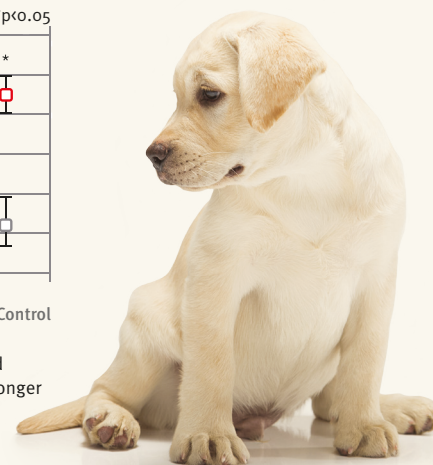
Dr. Ebenezer Satyaraj,
Senior Research Scientist,
Nestlé Purina

CDV Vaccine Response

CDV: Canine Distemper Virus



Animals fed diet with OPTISTART® demonstrated enhanced immune status – CDV response is stronger and lasts longer



THE NUTRITIONAL PHILOSOPHY AT THE HEART OF EVERY PURINA PRODUCT





1

OUR DIFFERENCE IS IN THE DETAIL

Ingredient quality and safety is the highest priority for Purina and is non-negotiable. Guaranteeing safety demands continuous commitment from our quality and safety department from raw materials to finished products and we use the very latest and most sophisticated analytical techniques. The purity of our product ingredients is verified by near-infrared (NIR) conformity testing using ingredient libraries that Purina scientists have developed over many years. This rapid technique is also used to confirm nutritional composition to ensure Purina products and ingredients meet our quality standards and used extensively throughout our pet food facilities.



Each Purina manufacturing facility worldwide maintains strict quality assurance controls through the diligence of on-site specialists. Our ingredient sources and state-of-the-art processes meet or exceed accepted standards, many of which are even more stringent than standards for producing human foods.

*“At Purina we put an emphasis on the quality of our supplier base and on the **Responsible Sourcing of our ingredients**. All potential suppliers to Purina have to go through a well-defined process to be added to our approved supplier list. This will include a quality audit which covers all the steps involved in the manufacture and distribution of materials sold to us.*

We will look at suppliers’ systems for monitoring incoming raw materials, the processing steps, how they clean their lines and how they control any risks or hazards in their system such as foreign bodies, pest controls, and temperature where relevant. Only if the supplier meets our stringent requirements can they be added to the approved list.”



Phil Jones,
Procurement
Director –
Raw Materials,
Nestlé Purina

2

WE ALWAYS STRIVE TO SURPASS STANDARDS – NEVER JUST MEET THEM

Pet foods are among the most **highly regulated products in Europe**. At Purina we strive to reach the highest standards to ensure that pet owners and professionals can recommend and use our products with complete confidence and trust.

FEDIAF (Fédération Européenne de l'Industrie des Aliments) is the European Pet Food Industry Federation. Established in 1970, FEDIAF represents around 650 European pet food companies in 26 European countries via 18 national or regional pet food industry associations. Its main function is to act as a partner to the pet food industry representing them at EU institutions and to guide them to meet European Pet food legislation.

“For many years, Purina has been a key contributor to FEDIAF achievements, with Purina scientists, nutritionists, regulatory and quality specialists working across seven working groups, from nutrition to environmental. FEDIAF also coordinates the efforts of national pet food industry associations representing pet food/pet care companies among whom Purina is proud to play a key role and share its expertise.”

Examples include the introduction of the Purina Body Condition Score System into the FEDIAF guidelines to enable owners and professionals to accurately judge body condition to assess if an animal is overweight.”

BODY CONDITION SYSTEM



TOO THIN		1 Ribs lumbar vertebrae, pelvic bones and all bony prominences evident from a distance. No discernible body fat. Obvious loss of muscle mass.
		2 Ribs lumbar vertebrae and pelvic bones easily visible. No palpable fat. Some evidence of other bony prominence. Minimal loss of muscle mass.
IDEAL		3 Ribs easily palpated and may be visible with no palpable fat. Tops of lumbar vertebrae visible. Pelvic bones becoming prominent. Obvious waist and abdominal tuck.
		4 Ribs easily palpable, with minimal fat covering. Waist easily noted, viewed from above. Abdominal tuck evident.
TOO HEAVY		5 Ribs palpable without excess fat covering. Waist observed behind ribs when viewed from side. Abdomen tucked up when viewed from side.
		6 Ribs palpable with slight excess fat covering. Waist is discernible viewed from above but is not prominent. Abdominal tuck absent.
		7 Ribs palpable with difficulty; heavy fat cover. Noticeable fat deposits over lumbar area and base of tail. Waist absent or barely visible. Abdominal tuck may be present.
		8 Ribs not palpable under very heavy fat cover, or palpable only with significant pressure. Heavy fat deposits over lumbar area and base of tail. Waist absent. No abdominal tuck. Obvious abdominal distention may be present.
		9 Massive fat deposits over thorax, spine and base of tail. Waist and abdominal tuck absent. Fat deposits on neck and limbs. Obvious abdominal distention.

BODY CONDITION SYSTEM



TOO THIN		1 Ribs visible on short-haired cats. No palpable fat. Severe abdominal tuck. Lumbar vertebrae and wing of fat easily palpated.
		2 Ribs easily visible on short-haired cats. Lumbar vertebrae obvious with minimal muscle mass. Pronounced abdominal tuck. No palpable fat.
IDEAL		3 Ribs easily palpable with minimal fat covering. Lumbar vertebrae obvious. Obvious waist behind ribs. Minimal abdominal fat.
		4 Ribs palpable with minimal fat covering. Noticeable waist behind ribs. Slight abdominal tuck. Abdominal fat pad absent.
TOO HEAVY		5 Well-proportioned. Observe waist behind ribs. Ribs palpable with slight fat covering. Abdominal fat pad minimal.
		6 Ribs palpable with slight excess fat covering. Waist and abdominal fat pad distinguishable but not obvious. Abdominal tuck absent.
		7 Ribs not easily palpated with moderate fat covering. Waist poorly discernible. Obvious rounding of abdomen. Moderate abdominal fat pad.
		8 Ribs not palpable with excess fat covering. Waist absent. Obvious rounding of abdomen with prominent abdominal fat pad. Fat deposits present over lumbar area.
		9 Ribs not palpable under heavy fat cover. Heavy fat deposits over lumbar area, face and limbs. Distention of abdomen with no waist. Extensive abdominal fat deposits.



Mary Sharrock,
External Relations
Director,
Nestlé Purina

3

GETTING THE BALANCE JUST RIGHT



Chef Amanda Hassner, Development
Culinarian, Nestlé Purina

We invest significant resources to refine the **palatability and digestibility** of our products, to **ensure pets enjoy eating our food while getting all the nutritious benefits**. The taste, smell, texture and form of pet food are all important influencers in determining palatability for cats and dogs and also whether pet owners enjoy feeding a particular food. A diet can contain the latest innovations and proven health benefits but has no value if a dog or cat won't eat it.

Our nutritionists collaborate with feeding behaviourists to help develop nutritious and delicious foods pets really enjoy eating. We have a professionally trained in-house chef who is a key part of the expert palatability team. Correlating what people like to eat with what pets enjoy requires **extensive study of human behaviour** and the insights help direct the formulation and flavours of new products.

*“Through **specially designed palatability studies**, we learn how pets react to new products and treats. Our food scientists focus on **ingredient quality** as well as **the structural texture of food** since those can be critical factors as they contribute to the overall acceptance of the finished product. **Excellent palatability** is important for pet food products to guarantee adequate food intake to meet daily nutrient requirements. We use a **proprietary electronic feeding system** to monitor food intake. Individual feeding stations allow us to measure food preference based on consumption. This sophisticated food tracking system also helps us collect data on feeding behaviour and measure daily intake, initial choice, speed of eating, first meal frequency, duration and size.”*



Dr. Sandra Lyn,
Senior Research
Scientist,
Nestlé Purina

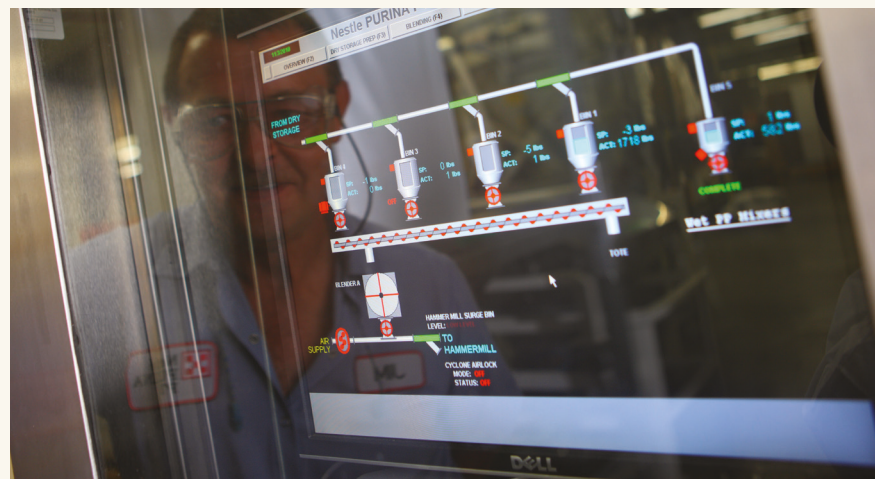


4

WE LOOK AT THE BIGGER PICTURE

By combining the diverse skills of our expert team, state-of-the-art technology and definitive scientific investigation, it is possible **to determine exactly how different formulas benefit the health of the pet**. Since some ingredients can enhance the performance of others, instead of focusing on single ingredients, our scientists study **smart nutrient blends and bio-actives** that are well-absorbed and utilised by the body, and measure how different formulations affect a pet's overall health.

Adopting this approach has led to many breakthrough discoveries, including LONGEVIS®: a patented innovative nutrient blend for adult cats aged seven years and above, that demonstrates the synergistic effect of a blend of nutrients.



5

ALL PURINA PRODUCTS ARE FORMULATED WITH THE SAME HIGH STANDARDS

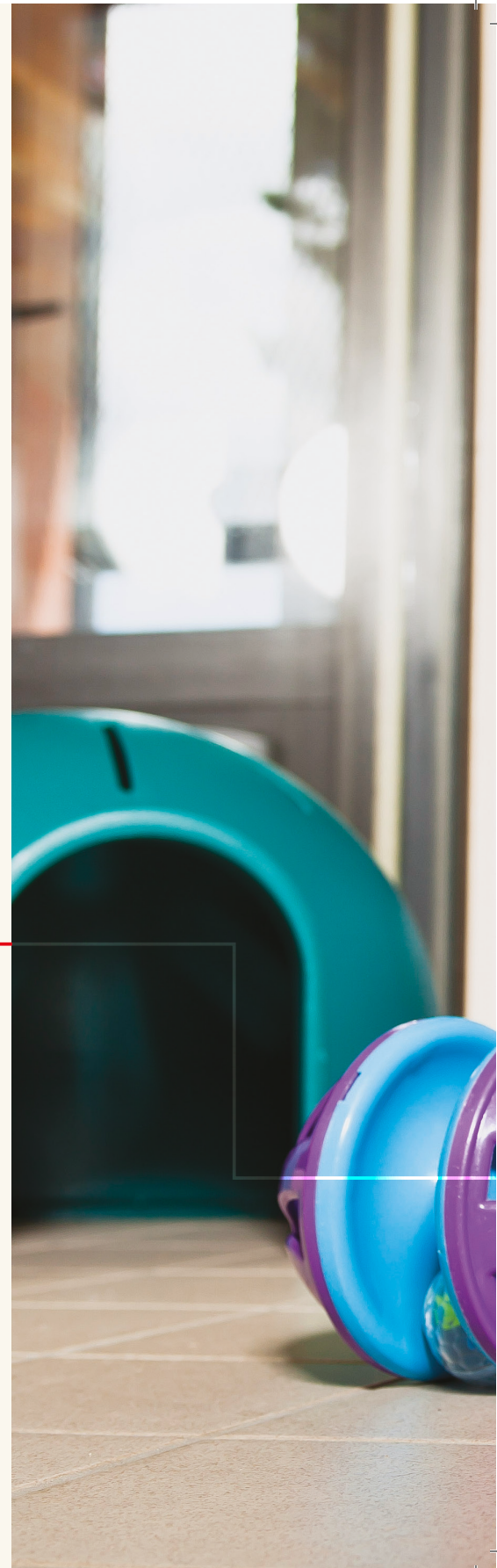


Regardless of the brand name, all Purina diets are formulated with **ingredients of the same high quality and standards**. This is because we believe that all pets deserve access to high quality nutrition. **Pet owners choose pet foods based on a variety of factors** including: where they prefer to shop, price, variety or routine, format whether wet or dry food and veterinary recommended diets with science-based health benefits.

As one of the world's leading pet food manufacturers, Purina is committed to producing diets that not only provide the best nutrition that dogs and cats enjoy eating, but also that owners enjoy feeding. **Extensive pet owner research provides consumer insights** and preferences that ensure as well as meeting rigorous nutrition standards for pets, every product provides a rewarding experience and satisfies pet owners' personal preferences. The extensive expertise and technologies available to Purina **enable the production of a wide portfolio** of pet foods from good quality standard diets available from supermarkets to super-premium foods available from specialist outlets such as veterinary clinics, to the most advanced and innovative veterinary prescribed clinical nutrition. Since so many factors influence your clients' choice of pet food, **Purina offers brand choice for every pet owner**, no matter where they shop or what they can afford.

PURINA'S LEADERSHIP IN ANIMAL WELFARE

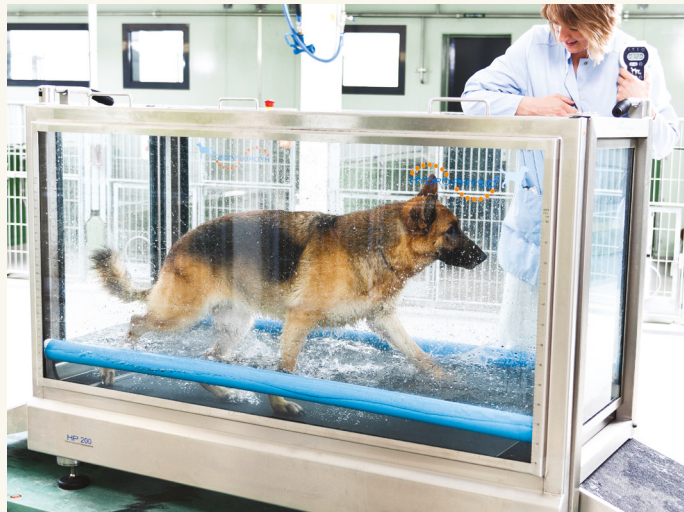
At Purina, we are **committed** to helping pets live longer, happier and healthier lives through proper nutrition and care. We have a **fundamental responsibility** to provide safe, palatable and nutritious products made to the highest standards of quality and safety. We understand and share the strong feelings of love and respect pet owners develop for their pets, because most of us are pet owners too. Therefore, **the welfare of dogs and cats is our top priority** and a responsibility we will not compromise.





Purina is committed to making food that dogs and cats enjoy, while **providing nutrition that enhances their health and well-being**. Studies conducted by or for Purina contribute knowledge that leads to improvements in the health and welfare of dogs and cats throughout the world. Purina conducts **only those procedures** that are **appropriate** for use with pet dogs and cats and that are **consistent** with excellence in veterinary care. We **do not participate in any invasive research** that causes injury, illness or disease, or that results in the euthanasia of dogs or cats.

At Purina we describe ourselves as “Petcentric” – when we design **a pet centre** to study the nutritional needs of cats and dogs, we design the buildings, facilities, services, environment and programmes **around the needs of our cats and dogs**.



ENSURING PET WELFARE

We follow all the legislative requirements but we consider them as the bare minimum to build on. For example, legislation tends not to consider a very important requirement: **to provide cats and dogs with individual love.**

In our pet centres we ensure our cats and dogs **live like pets live at homes.** This is not driven by public image but by an important scientific principle: **“the sample must represent the general population”.** If we want to know that our cats and dogs respond in the same way as the general pet population, we must make sure that our cats and dogs live in the same way. Therefore, our goal is that at Purina Pet Centers our cats and dogs live in and experience the **same atmosphere** and behave like the loved pets people keep in their homes.

The welfare of our pets is built on **four key foundations:**

- A **proactive attitude** towards health care
- Properly **enriched environments**
- Effective **socialisation programmes**
- **Dedicated professionals** who pride themselves in the care they provide to our cats and dogs

*“Our puppies and kittens enjoy a **socialisation programme** from their first day. **The goal is** to ensure they grow into healthy and balanced individuals who, at some point, are likely to be adopted into a family home. When adopted, our cats and dogs fit in their new home as if they have been there all their lives, because normal family life is what they are used to.*

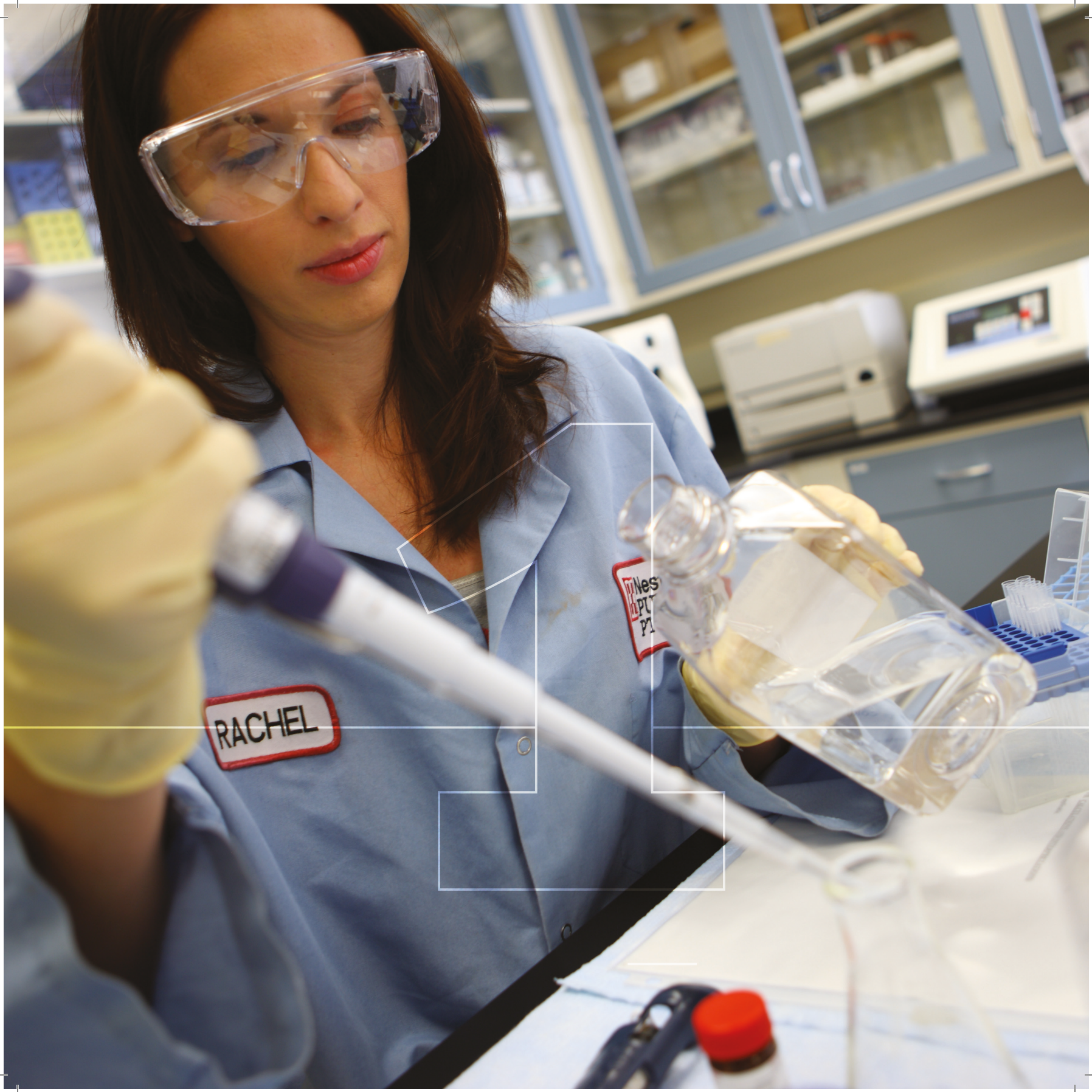
*We know that **pets who are bonded to people** have emotions, and that these emotions impact their physiology, such as hormones and heart rate, as well as their behaviour and activity levels. All these in turn affect energy requirements, immune response, antioxidant status, digestion, gut microflora and the aging process, as well as their natural food choices.*

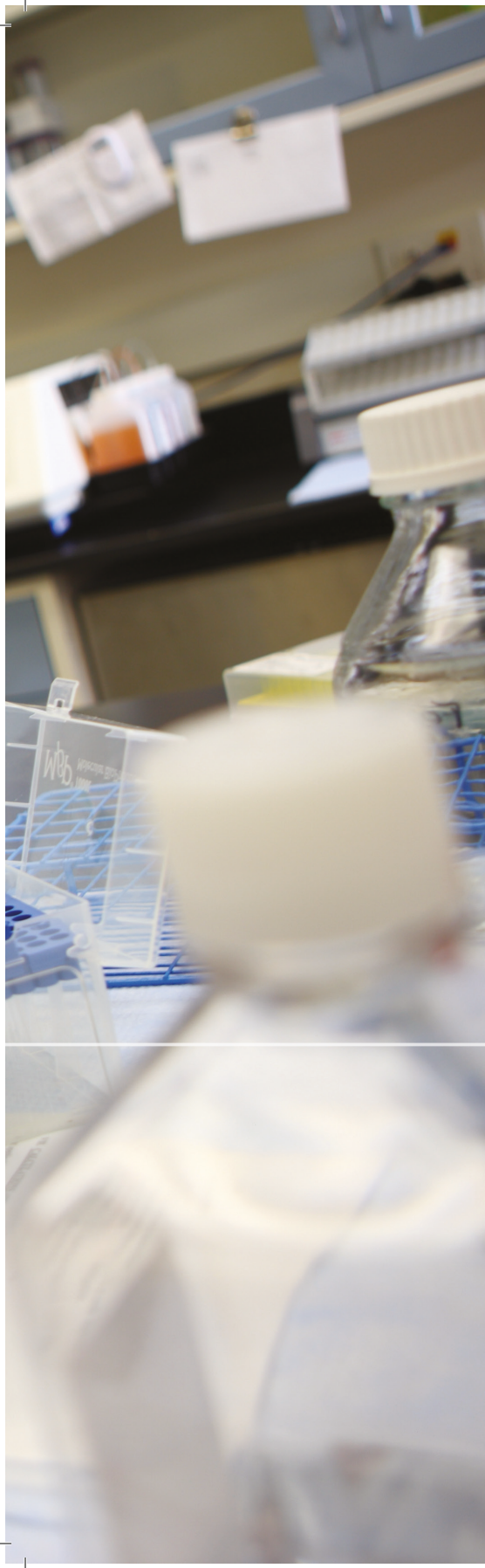


For Purina, **pet nutrition** is therefore not just a physiological function; it is something intrinsically **linked to the complexity and richness of pet-human relationships.** We care about the genuine needs of cats and dogs, so we study both their nutritional and their emotional needs. Amongst veterinarians we have a saying: “People will not care about how much you know until they know how much you care.”



Gerardo Perez, DVM, PhD,
Global Pet Welfare and
Behaviour Manager,
Nestlé Purina





PIONEERS DRIVING THE PET FOOD INDUSTRY FORWARD

Purina has a long history of bringing breakthrough innovations **to the pet food industry**, many of which have **redefined industry standards**.

The next pages show examples of Purina innovations that were **global 'firsts' in the pet food industry**, promoting the health and well-being of pets worldwide.



First Purina Factory

“At Purina, we never stop looking for new and innovative ways to improve the lives of our pets. We’ve been the leader in this industry for almost 120 years, and no one has a richer history of continually delivering benefits for pets than Purina has. And as we enter into the second century of innovation, we’re going to keep pushing forward.”

We are committed to this because we believe in the future and the promise it holds for our pets. We believe that one day the health challenges faced by today’s pets will be nothing more than a memory. We believe that by enriching the lives of pets, we will continue to enrich the lives of the people who love them – and we are committed to making a difference.”

Dan Smith,
Vice President and Global Head of R&D,
Nestlé Purina

FIRST IN PET FOOD TECHNOLOGY INNOVATIONS

1927

1ST COMPLETE DOG FOOD
WINALOT®

1929

1ST BONE SHAPED BISCUIT
BONIO®

1957

1ST EXTRUDED DOG FOOD
Purina Dog Chow®

1961

1ST PET FOOD COMPANY TO ADD
TAURINE TO DRY CAT FOODS
Friskies® Cat Food

1962

1ST EXTRUDED DRY CAT FOOD
Friskies® Cat Food

FIRST IN PET FOOD NUTRITIONAL INNOVATIONS

1976

1ST WEIGHT LOSS DIET FOR DOGS
Fit & Trim

1991

1ST FUNCTIONAL PET FOOD TO PROMOTE
FELINE URINARY HEALTH

Purina CAT CHOW® Special Care, the first cat food to receive FDA (US Food and Drug Administration) approval for a urinary tract health claim in cats.

1992

PURINA PRO PLAN® VETERINARY DIETS®
OM OBESITY MANAGEMENT

First diet to use high protein levels to help maintain lean body mass during weight loss.

1994

1ST AND ONLY VETERINARY PRESCRIBED
GASTROINTESTINAL DIET TO USE MCTS

PURINA PRO PLAN® VETERINARY DIETS® EN GASTROINTESTINAL – first diet to incorporate medium-chain triglycerides in canine diets to help in the nutritional management of dogs with gastrointestinal disease.

1998

1ST VETERINARY PRESCRIBED HYDROLYSED DIET

PURINA PRO PLAN® VETERINARY DIETS® HYPOALLERGENIC – first diet to use hydrolysed protein to nutritionally manage dogs with food allergies (patented 2002).

2004

1ST DIET TO APPLY NUTRIGENOMICS TO HELP MANAGE DISEASE

PURINA PRO PLAN® VETERINARY DIETS® JM JOINT MANAGEMENT – first diet formulated to help improve mobility in arthritic dogs through the use of omega-3 fatty acids to reduce the expression of the osteoarthritis gene.

2000

1ST DIET TO USE FIBRE TO NUTRITIONALLY MANAGE FELINE HAIRBALLS

First company to use fibre in cat food to help manage hairballs in cats.

2000

1ST VETERINARY PRESCRIBED FELINE DIABETES DIET FORMULATED WITH HIGH PROTEIN AND LOW CARBOHYDRATE LEVELS

PURINA PRO PLAN® VETERINARY DIETS® DM DIABETES MANAGEMENT – first diet with high protein and low carbohydrate content for the dietary management of cats with diabetes (patented 2001).

1998

1ST DIET TO INCORPORATE PREBIOTICS TO PROMOTE DIGESTIVE HEALTH

FRISKIES® Digestion+ – first diet to use prebiotics, incorporating chicory root, a natural, rich source of the prebiotic inulin to promote balanced intestinal microflora.

2005

1ST DIET TO USE COLOSTRUM TO HELP SUPPORT THE NATURAL DEFENCES OF PUPPIES AND KITTENS

PRO PLAN® Puppy with OPTISTART® enhances specific immune response to vaccination and promotes local gut immunity.

2006

1ST CAT DIET PROVEN TO EXTEND A MATURE CAT'S HEALTHY LIFE

PRO PLAN® ADULT 7+ with LONGEVIS® – first and only cat food clinically proven to extend a mature cat's healthy lifespan. A proprietary blend of nutrients which supports key vital functions (immune, renal and digestion) as well as balanced minerals for a healthy urinary system.

2006

1ST PROBIOTIC SUPPLEMENT FOR CATS AND DOGS IN A THERAPEUTIC DIET RANGE

PURINA PRO PLAN® VETERINARY DIETS® FORTIFLORA® Probiotic Supplement for dogs and cats – the first probiotic supplement in a therapeutic diet line, containing the SF68® strain exclusive to Purina, clinically proven to promote intestinal health and balance.

2010

1ST WELL DOG DIET CLINICALLY PROVEN TO IMPROVE CANINE COGNITIVE FUNCTION

PURINA PRO PLAN® Senior+ with ANTI-AGE – first canine maintenance diet to include Medium Chain Triglycerides (MCTs) clinically proven to improve cognitive function in older dogs.

FIRST IN SPECIFIC TOOLS & NUTRITIONAL APPROACHES TO PROMOTE PET WELL-BEING

1993

1ST TOOL DEVELOPED FOR VETERINARIANS TO MANAGE BODY CONDITION IN PETS

The Purina Body Condition System – a tool used by veterinarians worldwide to measure body condition in pets.

1999

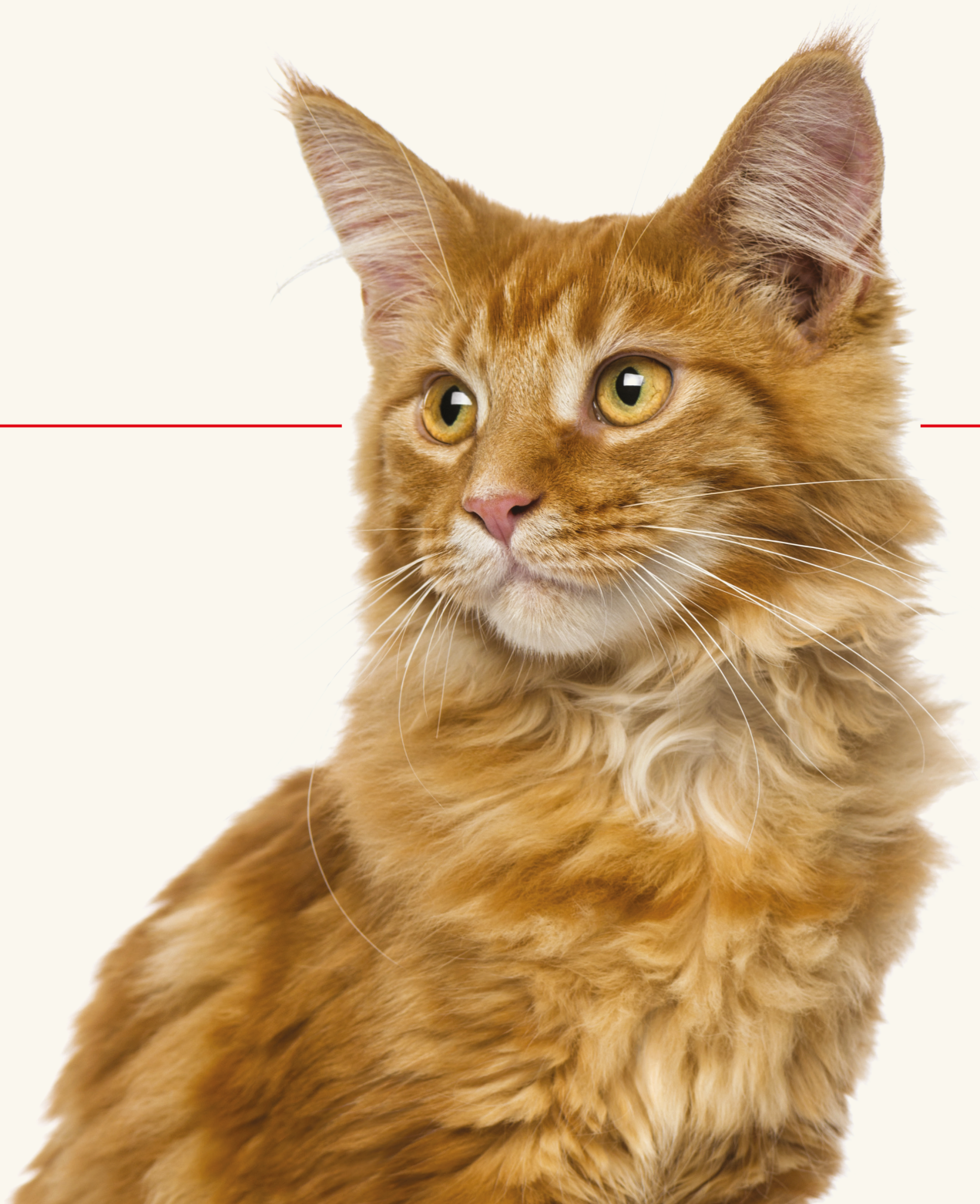
1ST CANINE REFERENCE FAMILY DNA DISTRIBUTION CENTRE

The establishment of the world's first and only Canine Reference Family DNA Distribution Centre, providing assistance to research in the mapping of the canine genome.

2001

1ST LONGEVITY STUDY TO DEMONSTRATE THE HEALTH BENEFITS OF MAINTAINING LEAN BODY CONDITION IN DOGS

Purina Life Span Study - First 14 year canine longevity study to clinically prove increased longevity and quality of life benefits when dogs are fed to an ideal body condition from puppyhood throughout life.





**WHAT'S
NEXT?**

AT PURINA, WE'RE ALWAYS SEARCHING

We're always looking for **new ways to challenge traditional thinking and bring more innovation to pet care**. We look forward, learning from the latest trends and insights to ask what's next? This requires being aware of and involved in **the latest scientific developments**, to anticipate how nutrition can impact health 10-15 years or more in the future.

One of the newest waves of nutritional research, **Nutritional Metabonomics**, addresses the comprehensive analysis of the entire metabolome under a given set of conditions. Using metabonomics in nutritional research is **a promising method to study metabolic health**, monitor nutrition status and identify biomarkers **for early disease diagnosis**.

As leaders in this particular area, Purina scientists are using molecular nutrition to identify gene-expression changes related to specific health conditions and examine how nutrition can help manage canine or feline health. Whether our scientists are studying the nutritional management of obesity, feline renal conditions or food allergies, **molecular nutrition helps** them to fully understand **the biological context of certain changes** and how they can be used in order to benefit dogs and cats.

In order to build a strong scientific foundation for research ideas and concepts that may be used in 10, 15, 20 years or more, **Purina scientists constantly ask themselves:**

- **What can we do better** to benefit cats' and dogs' health?
- **What else can we offer to pet owners** to enjoy long, happy and healthy days with their pets?
- **How can we support the veterinary profession** in their challenging everyday role of taking care of pet health and wellbeing?



*“Purina established the **Purina DNA Distribution Centre** to help advance development of the canine genetic map by disseminating samples of reference family canine DNA. Scientists worldwide can apply to receive DNA samples, and discoveries made with these samples ultimately are added to knowledge of the canine genetic map. This collaborative effort on the canine genetic map, along with Purina’s relationship with the AKC (American Kennel Club) Canine Health Foundation, **contributed to the selection of the dog genome for sequencing**. This sequencing was conducted at the Whitehead Institute/Massachusetts Institute of Technology Center for Genome Research, one of the institutions that contributed significantly to the human genome sequencing.”*

Dr. Steve Hannah,
Research Director, Nestlé Purina

WHAT’S NEXT?



“We feel very strongly about this. We are never finished. We’ve never learned enough, and we can never know enough. So we are constantly trying to pursue the improved wellbeing of the pet.”

Dan Smith,
Vice President and Global Head of R&D,
Nestlé Purina

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Your Pet, Our Passion.®