

Innovating the future



Good Food, Good Life

Research & Development for
Nutrition, Health and Wellness





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Foreword

“
Through our strategies
we anticipate the future.
Through our actions we
shape the future

”
Peter Brabeck-Letmathe

At the beginning of this century, Nestlé made the strategic decision to transform itself from a successful, technology-driven food and beverages company into an R&D- and marketing-driven Nutrition, Health and Wellness Group.

Turning this strategic vision into reality requires a re-orientation of our R&D efforts towards life science and an open collaboration environment that constantly delivers bigger, bolder and better innovations.

Although we have more than 4500 people in Nestlé Food and Beverages R&D, we cannot achieve our ambitions simply by working internally. We increasingly operate in an Open Innovation mode to enhance our own internal R&D capability by tapping into external resources. To do this, we have built up a network of some 300 external research institutions, allowing us to work regularly with scientists and technologists in universities, research establishments and private industry all over the world.

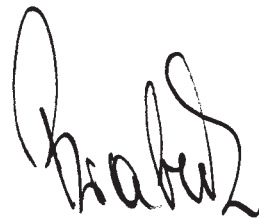
These partnerships are mutually beneficial. We benefit from identifying new opportunities and integrating them into our business. Our partners benefit from access to our specialist knowledge and our tradition of best-in-class technology.

Open Innovation also opens the door to greater innovation cooperation between companies affiliated with Nestlé. Joint research by Nestlé and L'Oréal is leading to totally innovative Nutrition, Health and Wellness products in the form of beauty nutritional supplements. We expect similar breakthroughs from collaboration with Galderma, one of the world's leaders in dermatology.

R&D's role is one of creating bridges not only outside the Company but also across the Company. That way we are building a wide base from which to drive our Nutrition, Health and Wellness transformation and further business growth.

Open Innovation to the outside is the way forward. But Nestlé's success is – and always will be – decided inside the Company. We continue to listen to our consumers and anticipate their future needs. We are proactive and aim for fewer and bigger breakthrough innovations. For our Nutrition, Health and Wellness products, this means establishing innovative pipelines beyond the next five years. Today we already think more like a life science company, with different projects in different phases at any given time... some in development or conceptualisation, some in clinical or consumer trials, and others in their launch phase.

For Nestlé to achieve all of this, R&D takes on even more importance. It forms the scientific base and creates the proprietary technology platforms in order to be leader in Nutrition, Health and Wellness.



Peter Brabeck-Letmathe
Chairman of the Board
and Chief Executive Officer



Preface

“
The shape of the Nestlé Group and the nature of our relationship with consumers are significantly dependent on Nestlé R&D

”
Werner Bauer

R&D is one of Nestlé’s strengths. It always has been. We constantly leverage our scale to new and more challenging heights. Innovation is the first pillar of our corporate strategy with Nutrition, Health and Wellness a core value.

Being faster and closer to the consumer through R&D considerably strengthens Nestlé’s leadership in Nutrition, Health and Wellness, where the body of world knowledge grows continuously. Insights like subtle biochemical markers, make the science of nutrition the prime mover in health maintenance and disease prevention. More and more consumers, in developed and developing countries alike, want to benefit from products and personal solutions through foods and beverages that contribute to their health and wellness.

To intensify our excellence in the consumer-food relationship, R&D works more and more in an “open innovation” mode. We actively involve scientific and technical expertise from many external sources. Nestlé R&D’s role includes the knowledge management needed in the multidisciplinary sciences and technologies that form the basis of innovation in Food, Nutrition, Health and Wellness.

Our “innovating the future” leadership strategy is based on:

- Continuous improvement in consumer insights and their translation to innovative products built on superior science and technology;
- Harnessing the vast expertise in our unmatched research and development network;

- Working closely with leading universities and outside partners on cutting-edge science and technology;
- Recruitment of open-minded and passionate innovators who can bridge science, technology and business needs;
- Bigger pioneering innovations that hit the “innovation sweet-spot” – where best-in-class science and technology combine to deliver precisely targeted Nutrition, Health and Wellness benefits that lead to significant business success.

For Nestlé, safety and quality are non-negotiable. R&D plays a key role in ensuring the best in products and processes. The further Nestlé moves along the road towards the Nutrition, Health and Wellness Company, the more this role becomes important.

This booklet on Food and Beverages R&D in Nestlé shows examples of our many successes. You will see how R&D at Nestlé is unique in its set-up and approach. How our core sciences and technologies support future growth. How we protect our intellectual property and know-how. How we operate to optimise quality and safety. And, above all, how we ensure that the consumer is at the heart of Nestlé R&D.

The future is in our hands.



Werner Bauer
Chief Technology Officer
Innovation, Technology and
Research & Development

Building on Nestlé's leadership in Nutrition, Health and Wellness

Nestlé's unique Food and Beverages R&D structure

Nestlé's vision for the future is to occupy centre stage as the World's Food, Nutrition, Health and Wellness Company through Good Food, Good Life. Nestlé products embody clear and relevant consumer benefits

Nestlé R&D generates the innovative science and technology needed to build nutritional and health benefits into products offering Nestlé's legendary sensory excellence. It thus plays a key strategic role in realising the Nestlé vision, helping to assure the Group's sustained growth.

Nestlé acts on the principle of "think global – act local". R&D is structured accordingly. Global product and process development is vertically integrated into all Nestlé core businesses and pushed out locally to the markets through some 500 factories in 100 countries worldwide. Throughout Nestlé, 265 000 people make a valuable contribution by their links across all sectors. At the local level, Nestlé interacts daily with over one billion consumers.

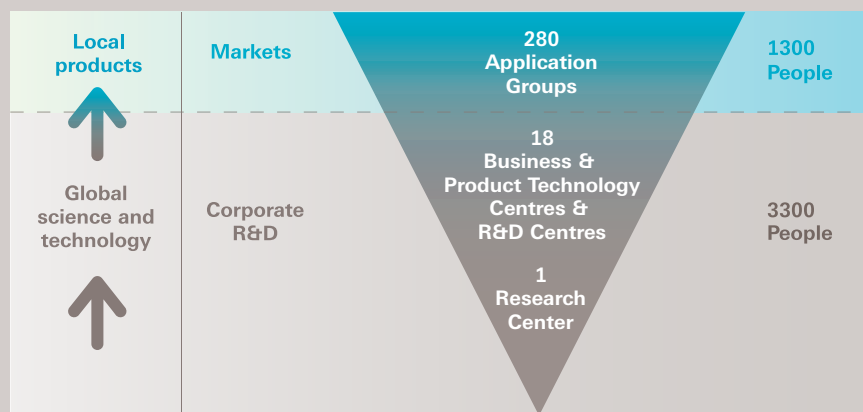
The R&D structure offers the flexibility to use this huge source of local ideas, bring them back and develop them for global implementation. This adds the power of broad-based consumer insight to the power of innovation. Together, these global and local approaches give us the capacity for rapid response in an ever-faster changing global socio-economic environment.

For strategic alignment, R&D interfaces with the Strategic Business Units (SBUs). The SBUs all coordinate strategies within the individual Nestlé business categories. This includes investment, competitive analysis, key performance indicators, quality & strategic brand standards and portfolio management.

Nestlé Food and Beverages R&D – Global strength, local development

This unique structure offers:

- Vertical alignment for products and processes in specific product areas;
- Horizontal cross-functionality across all business areas and activities.



- The **Nestlé Research Center (NRC)** is internationally recognised for its ground-breaking work in the food and nutritional sciences. In-house expertise, reinforced by close collaborations with Nobel Prize winners and prestigious universities, provides a solid base for R&D innovation across all Nestlé business sectors.
- The **Business Technology Centre (BTC)** develops and enhances all our business systems to constantly improve the efficiency of Nestlé operations.
- Eight **Product Technology Centres (PTCs)** each employ in a single location the critical mass of experts in food technology and engineering to act as a hub for all global product and process development in one or more of Nestlé's businesses.
- Nine **R&D Centres** have a dual global/local role, working closely with the Product Technology Centres in joint projects, but also fulfilling regional needs requiring R&D input.
- 280 **Application Groups (AGs)** based in Nestlé factories supplement the R&D process at the local level, ensuring that products comply with local regulations and taste preferences. They also work with experts from PTCs and R&D Centres in the factories to install and test new process lines and ensure first-line follow-up in day-to-day operations.

Innovating Nestlé's future through shared values for the Group and the consumer

Food and Nutrition are part of the solution to offer consumers health and wellness. Physical activity and other lifestyle factors also play their role. Nestlé goes beyond product innovation, providing wider health-solutions through consumer education in nutrition and personal lifestyle coaching

R&D has been in Nestlé's genes ever since Henri Nestlé invented the first Infant Food. For almost a century, Nestlé fulfilled consumers' needs through foods for sustenance and convenience. Modern lifestyle changes from the 1950s brought new R&D challenges. With less and less physical work, with automobiles, labour saving devices, TV, video games, Internet, etc., consumers have increasingly more time to seek pleasure from their foods. But an imbalance between food consumed and physical activity have been paralleled by a huge increase in obesity and related non-communicable diseases.

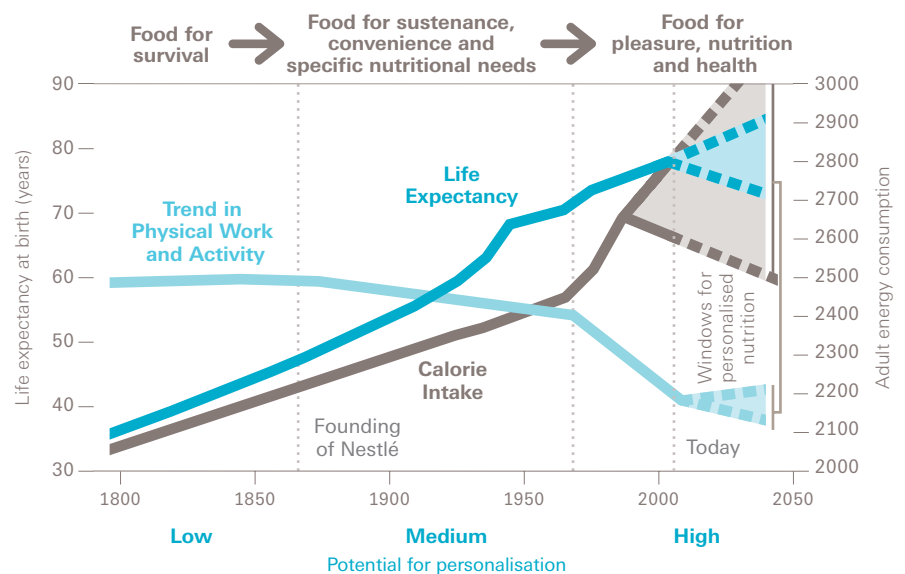
So Nestlé asked the question, "Are yesterday's good foods still the good foods of today and, if not, what do we have to change?" Nestlé's response is to produce foods that offer consumers Nutrition, Health and Wellness, along with the essential ingredients of taste and pleasure. Consumers continue as before to make their own choice of the food and beverages they consume. Nestlé helps them to make his or her individual choice the right choice.

R&D must show the direction to take to meet the challenges imposed by the new consumer needs of today and tomorrow:

- A broad portfolio of research projects across all Nestlé product categories is revealing preventive nutrition solutions for weight and diabetes management, cardiovascular health, etc.;

Evolution of dietary needs

Why has personalised nutrition become important?



- The nutritional profiles of all Nestlé products are continuously assessed, updating recipes and formulations. Applying state-of-the-art knowledge in food safety and nutrition leads to continuous improvement, offering the best products in the market-place;
- A sustained R&D effort on health and wellness products addresses specific consumer groups:
 - Infants and young children for optimal growth and development,
 - Consumers of all ages needing special diets for certain health conditions or in convalescence after surgery or trauma,
 - Elderly consumers who want to keep mobile and mentally active to prolong the pleasures of life into old age; really "putting more life in the years",
 - Athletes who want instant or slow-release energy to match their sports demand.

Through this, Nestlé R&D is opening up a future where a more personalised nutrition will become a reality. Thus bringing shared values that benefit both the consumer and the Group. In its vision as the world Food, Nutrition, Health and Wellness Company, Nestlé is making this future its own.

Powerful R&D: Nestlé's strong commitment

The Nestlé long tradition of technological excellence is now combined with superiority in Nutrition, Health and Wellness. The Group is becoming ever more R&D intensive

In 2006, Nestlé has invested CHF 1.73 billion in R&D and over CHF 1.5 billion in Venture Capital. This increase in investment is reinforcing Nestlé R&D's world-class reputation in science and technology:

- We are accelerating Nestlé's transformation to Nutrition, Health and Wellness with the enhanced controls and product tests this implies;
- We are intensifying science-driven Food and Nutrition R&D, which brings added value to Nestlé by expanding our knowledge base;
- We are building Nestlé's food and beverages systems, by combining product technology and dispensing machine technology, e.g. the single portion beverages, *Nespresso* and *Nescafé Dolce Gusto*.

We attract the best scientists and engineers from top-level universities who want to work and partner with us:

- **Three Nestlé University Chairs in Nutrition are now active**
Two chairs are at the EPFL (Ecole Polytechnique Fédérale de Lausanne), Switzerland, for research on the link between nutrition and the brain, including the development of cognitive function in childhood and Alzheimer's Disease.

One chair is at the University of Mexico City, Mexico, for research on Nutrigenomics, to investigate how individual genes may influence individual nutritional needs;

- **Annual Nestlé International Nutrition Symposia**
These are organised in the Nestlé Research Center. Nobel Prize winners and other leading experts in nutrition and health worldwide debate issues of human health and physiology, and publish their conclusions in the scientific press. These discussions open new directions in Nestlé research on Nutrition, Health and Wellness;
- **The Nestlé Nutrition Council (NNC)**
First created in 1978, the NNC consists of external and independent advisors on human nutrition. It provides a vital input for Nestlé in nutrition and food safety policies, general nutrition guidance and scouting for future innovations.

We make targeted acquisitions of nutrition-based businesses that bring new skills and know-how enhancing the Nestlé R&D knowledge-base:

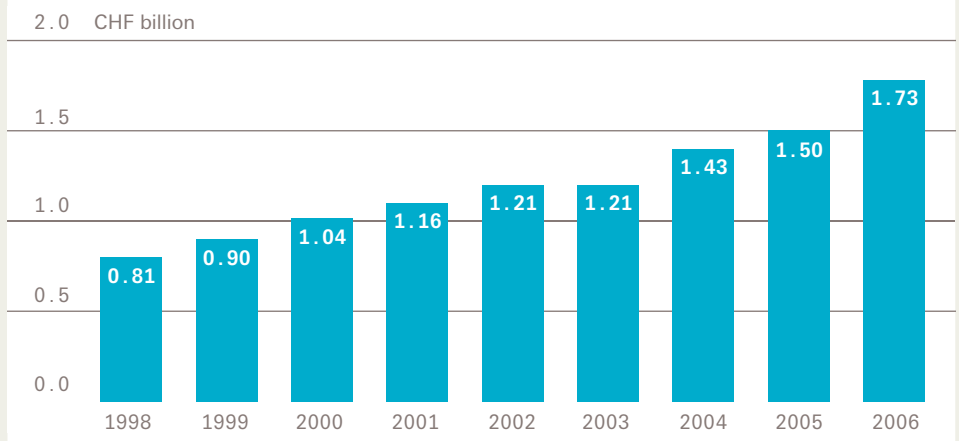
- Jenny Craig in the US for personalised weight management solutions;
- Uncle Toby's in Australia for adult nutrition snacks.

These continuously improve our R&D structure and capabilities to ensure efficiency in innovation.

R&D Investment is constantly increasing

In Nestlé's 2006 R&D:

- 60% is invested in Food, Nutrition, Health and Wellness
- 40% is invested in pharmaceutical businesses



Who and what is Nestlé R&D?

Structured for efficacy

Nestlé created the Strategic Business Units in the 1990s, along with a parallel change in R&D to become more business effective. This has given a sound base for maximising R&D efficiency through vertical alignment in category-specific product and process development, while retaining horizontal interactivity across the market-place

Nestlé R&D – A science and technology resource second to none

R&D at Nestlé is an international group of science and technology centres of excellence. Its geographically dispersed, multi-centre structure provides the flexibility for continuous adaptation to the evolution of corporate strategy and business needs.

Its global strength allows Nestlé to leverage the full scope and scale of the Group's broad technology base through networking. Its local strength brings it into close contact with the consumers it serves.

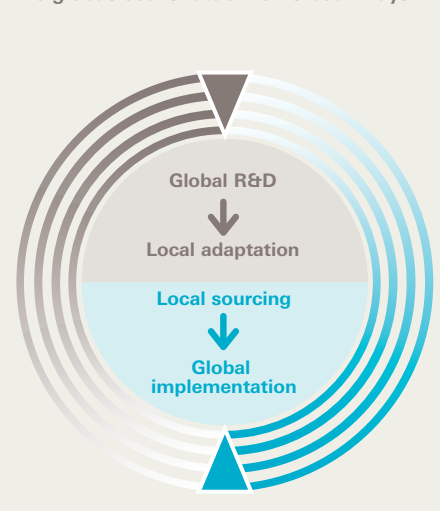
The Nestlé Research Center – renowned for scientific excellence

Nestlé has the biggest private facility for fundamental research on food, nutrition and the link to health in the world. This is the Nestlé Research Center (NRC) in Switzerland. It has a long-standing reputation for scientific excellence, forged by scientists who are at the leading edge in their fields on the international scene. Over 250 scientific publications every year testify to this excellence.

Specific research areas include product, process and ingredient safety, sensory and nutritional quality, physiology and metabolism, nutrient uptake, food structures, and the triggers of appetite and satiety. NRC works with all businesses, but in particular the global Nestlé Nutrition business where it provides the science behind Infant, HealthCare and Performance Nutrition products as well as Weight Management.

Outside Nestlé, NRC works with key universities and research institutes worldwide: among many others, Harvard University and MIT (US), Imperial College London (UK), Wageningen University (NL),

The global/local shuttle works both ways



Kyushu University (JP), Shanghai Jiao Tong University (CN), EPLF at Lausanne (CH), and the University of Mexico City (MX).

Business Technology Centre – best practice throughout the business Nestlé has a unique advantage in its extraordinary Business Technology Centre (BTC), located in Switzerland. This is at the heart of the famous GLOBE business excellence programmes, with best-in-class operating methodologies and systems. GLOBE is a key element in Nestlé's massive R&D investment. It develops the technology behind the way we do business to ensure that we identify best practices and can replicate them throughout all businesses.

GLOBE offers a Best Practice Business Process and custom developments. Implementation takes into account the specific local needs.

Product Technology Centres – leaders in Product, Process and System Development The eight PTCs illustrate the success of Nestlé's drive for R&D efficiency. Before their creation, Nestlé's geographically dispersed R&D Centres often worked mainly for their local market. This was inefficient. Two or more centres could be working independently on the same project. The Nestlé PTCs changed this with a simple principle. You get there faster with a multi-centre team rather than having small teams competing to see who gets there first.

Today, each PTC is responsible for category-specific innovation aligned with one or more of the Nestlé Strategic Business Units and Global Businesses. This gives a global/local framework for multi-centre and multi-market projects. The PTC drives the projects by drawing on the wealth of experience in NRC. The other R&D Centres and the Application Groups bring in their additional skills as required. This gives efficiency and vitality in the innovation drive.

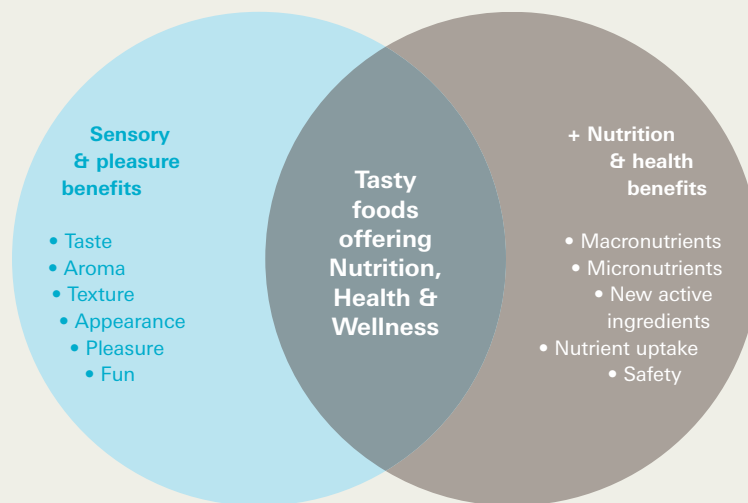
The biggest PTC, in Orbe (CH), is the Lead Centre for a number of businesses:

- Coffee and Beverages for *Nescafé*, *Milo* and *Nesquik*,
- The Global Nespresso Business,
- The Global Nestlé Nutrition Business,
- Cereal Partners Worldwide (the Nestlé and General Mills joint venture) for breakfast cereals and cereal bars,
- FoodServices for vending machines and related products.

Other PTCs work in a single business. An example is PTC Beauvais (F) which develops ice cream products, in close cooperation with R&D Groups in Bakersfield

Nestlé uniquely occupies the middle ground by combining sensory excellence with proven health and wellness benefits

Bringing taste and nutrition together in the same product is not easy. Nestlé works on the principle that healthy foods do not need to taste bad, and puts this principle into practice by pulling together its 60:40+ expertise in taste and texture with its expertise in health and nutrition. R&D's in-house strength in the science and technology of foods on the one side and their impact on health on the other allows Nestlé to occupy the middle ground of Food, Nutrition, Health and Wellness. (For reference, 60:40+ is Nestlé's sensory preference initiative to ensure that at least 60% of consumers prefer the Nestlé nutritionally assessed product compared to competitors.)



(US), Parma (IT), and Shanghai (CN), to meet local needs for products worldwide.

R&D Centres complement the PTCs – a broader-based project portfolio. Nine R&D Centres worldwide have a dual role, global and local, most often working in joint projects with the PTCs or Application Groups. R&D Marysville in the US, the biggest of the R&D Centres, brings extensive expertise in engineering to a wide variety of products. In China, R&D Shanghai covers the broad national and local needs of this huge country with some 20% of the world's population and immense prospects for business growth.

Their role is critical at a regional level in the two-way flow of knowledge from global R&D out to the local Application Groups and back.

Local Application Groups – factory-based R&D

The R&D effort is completed at the local level by 280 product and process Application Groups working locally in Nestlé factories. They employ from one to as many as 20 or 30 people. Application work involves using ingredients, processes and packaging skills already

existing inside Nestlé. They adapt already proven products/processes: to comply with their local legislation or suit local tastes which can differ markedly from one country to another; to reduce their operating costs; to increase the range of existing product lines. This allows Nestlé to rapidly adjust its global R&D developments to suit the specific needs of consumers worldwide.

A powerful network for collective knowledge management. Efficient networking is critical for communication within Nestlé. Equally so with the outside world to drive open-innovation.

Based on the collective knowledge in R&D, a number of expert networks operate globally. These formally link R&D units and markets worldwide on a continuous basis. They can thus benefit from each other's experiences.

Four networks are shared by the whole of R&D and Nestlé Operations: the Quality & Safety, Nutrition, Sensory & Consumer Preference and Food Science & Technology Networks.

These cover aspects of science and technology that are common to every

Nestlé product category and even every product. They provide Nestlé with a standardised way of working in day-to-day operations. For example, using standard methods for Sensory Preference tests means that a result from anywhere in the Nestlé world can immediately be interpreted everywhere else. Similarly, the Nutrition Network shares nutrition expertise across every R&D facility and into every market. This common language of standardisation is critical in assuring consistent quality of all Nestlé finished products coming out of every factory.

Making technology work

Production line technology

A manufacturing line for food products consists of a sequence of linked unit operations, where each plays its part in transforming raw materials safely into end products, wrapped and packed for distribution.

A constant challenge for R&D is choosing technologies that work from a laboratory scale up to an industrial scale where the volumes can be measured in hundreds of tons per hour! Even an apparently simple operation like mixing an ingredient into a product is not that simple. How can we be sure that it mixes evenly? Not a banal question when the ingredient is a bioactive substance with a specific health benefit and we have to guarantee that every finished product contains exactly the same amount... the amount guaranteed on the label.

Engineering and Food technologies

Engineering technology focuses on creating the machines that perform and combine the unit operations.

Food technology covers a wide range of aspects: how to “personalise” the way machines are used to make a particular product; how ingredients interact during processing to give flavours and textures; how to ensure efficient uptake in the body of nutrients for health. A good example is how to use less salt and fat in a product, yet provide the same salty and fried taste – as in *Maggi 2-Minute Noodles* (see p. 26).

Many of Nestlé’s key technologies were not originally developed for the food industry. Spray drying, used in manufacturing milk powders and *Nescafé*, was first used to make powdered paint dispersions. Extrusion technology, used in Nestlé, e.g., for breakfast cereals, snacks, cereal bars and dry pet food, was originally developed for the plastics industry. One of its first uses was to make expanded polystyrene plates and cups.

To make the wafer for *Kit Kat*, R&D even experimented with baking trays



lined with the same ceramic material used on the nose-cones of space shuttles.

The creativity in Nestlé R&D to “think out of the box” is so often the key to the real break-through innovations for today and the future.

Constantly improving technologies

Nestlé R&D has a long tradition of building its own machines based on extensive in-house engineering experience. Today this is being actively supplemented by looking to get the best out of the outside world as well as from inside, and gaining competitive advantage by personalising commercially available industrial equipment. Proprietary technological claims in all product categories help Nestlé to maintain or improve its position as market leader.

Improvements in coffee technology have constantly enhanced the great taste of *Nescafé* and *Nespresso*. Conversion of extrusion cooking technology to extrusion freezing has led to the incomparably smooth texture of new Nestlé ice creams, even with half the fat (see p. 24).

Fermentation technologies have led to a whole range of new probiotic products

with proven health benefits. Plus the innovative breads and pastries made with yeasts that “hibernate” in the fridge, but awakened during preparation to give a wonderful fresh-baked product. Ongoing developments in savoury flavours have made possible today’s range of *Maggi* bouillons and seasonings that offer premium flavour, convenience and nutrition, all at an affordable price.

New technologies invent the future for the consumer

Our continuous “technology watch” is a valuable tool for R&D. It allows us to quickly identify and be the first to hear about new opportunities from academia and start-up companies all over the world. It opens up opportunities to work with them as partners when there is a potential for Nestlé.

Nestlé has committed more than CHF 1.5 billion over the next 10 years to investments in start-up and growth-phase companies within the broad sectors of Food, Nutrition, Health and Wellness. Some investments come through Nestlé’s Venture Capital network, and some directly from Nestlé itself. Together, these investments open the doors to the most promising innovations and to bring them on board when an appropriate business case exists. It also allows us to track external innovation, enhancing to our open innovation models.

Innovation – shared responsibilities, alignment and cross-functional teams



Innovation and invention

Innovation is not just a question of invention. An invention becomes an innovation when it is translated into a product or a new business. Innovation therefore entails not just creation, but also bringing a product to market. This demands close R&D-to-business alignment and teamwork.

Unlike Henri Nestlé's time, innovation today rarely depends on a single individual. It involves a wide, but well orchestrated group. R&D is a core player, but shares the responsibility with marketing, manufacturing, supply chain, sales, finance, regulatory affairs, human resources and other functions.

Importantly, regulatory affairs is part of every project right from the start to ensure, before any development begins, that any new product or process will comply with all international and local specifications for health and safety. This includes regulations on permitted ingredients, and even cultural and religious imperatives. A clear example of "think global – act local".

It is also important from the start of any project to build in a clearly defined

strategy for intellectual property to protect and secure our knowledge and know-how.

The complexity of modern-day innovation demands strict alignment between all business functions to maximise the potential for success in new products and processes. Having clear ideas up-front enables Nestlé businesses to set long-term plans with seamless implementation. This is why Nestlé has set up cross-functional working teams that include R&D, the Strategic Business Units and Global Businesses and Nestlé markets. Everyone involved is a full contributor, co-owner and co-beneficiary in the innovation process.

Innovation dynamics differ from one product category to another

The contribution of R&D is tailored to the specific needs of each of the Businesses through a good balance between science and technology push and consumer pull.

All our experience in innovation proves there is no "one-size-fits-all" approach for all product categories. Each category has its own specific dynamics. Consumer needs and desires driving innovation in

culinary or ice cream products are mainly sensory and subjective. They often differ from one geographical region to another. Innovations in these categories are traditionally driven by "Consumer or Market Pull".

For innovation in sectors like infant formulas, healthcare nutrition and pet nutrition, most consumer needs are more physiological. These are still globally defined by the consumer. They are then translated into physiological and metabolic needs by research and healthcare professionals, as a function of new knowledge, and in line with strict guidelines like the CODEX specifications for infant nutrition worked out with the World Health Organisation.

In all product categories our innovation skills may identify products that fulfil needs the consumer cannot anticipate and, therefore, cannot express. In these areas the creation of new products comes from R&D drive supported by consumer understanding. Key examples from Nestlé R&D are extrusion freezing technology to make low-fat, premium ice creams (see p. 24), and probiotics that offer health benefits in a wide spectrum of Nestlé food products (see p. 34).

How does Nestlé R&D work?

Through projects creating differentiation

Bringing in consumer insight

Nestlé R&D is skilled at establishing consumers' nutritional needs from a physiological, psychological and metabolic viewpoint. To create truly relevant products more is needed; we must be able to identify present and future consumer needs. For this, working closely with business and market colleagues to gain their consumer insight is essential. This is not just short-term trends, but also other factors having a major impact on lifestyle in the longer term.

We need to probe deeply into consumers' needs and motivations. Then, we must use Nestlé's strength in R&D to address these insights better than our competitors. We must apply our technological creativity and scientific skills through superior and proprietary technology. In particular, break-through consumer insights enable us to develop innovations that build Nestlé brands and businesses.

Insight has a number of components:

- It must be a fundamental truth;
- Relevant to a specific brand or business;
- Which strikes a chord with the consumer;
- And leads to a competitively differentiated idea, powerful enough to change behaviour.

This definition separates true insight from what is simply "interesting information".

Selecting and prioritising R&D projects

We have no shortage of ideas. The key is to know what and what not to innovate.

So before defining a R&D project and starting work on it, each idea goes through an exploratory phase where people from R&D meet with their business and market counterparts in the relevant categories.

The exploratory phase asks key questions:

- Does the proposed project correspond to a real consumer need?

- What is the specific consumer benefit we want to deliver?
- Which would be the most appropriate product?
- Is it part of Nestlé's business strategy for that product category?
- Do we have or can we develop the appropriate technology?
- Should we do the job under the auspices of Nestlé?
- Would it be better handled in a joint venture, such as Cereal Partners Worldwide, or the innéov joint venture with L'Oréal for beauty nutritional supplements?

The exploratory phase in project selection is critical. Every new project must fit the "innovation sweet-spot" to be sure it meets consumer needs and desires and maximises profitability.

We must look at a potential project in terms of how we compare with our competitors. This means balancing costs and risks. Are we in a "red ocean" field where competition is strong? Or a "blue ocean" with no market competition and where we know it will not be easy to copy?

We have to assess the probability of whether the consumer will accept our new product. Our exhaustive project selection process ensures that we choose projects that merit investment and use our R&D as efficiently as possible.

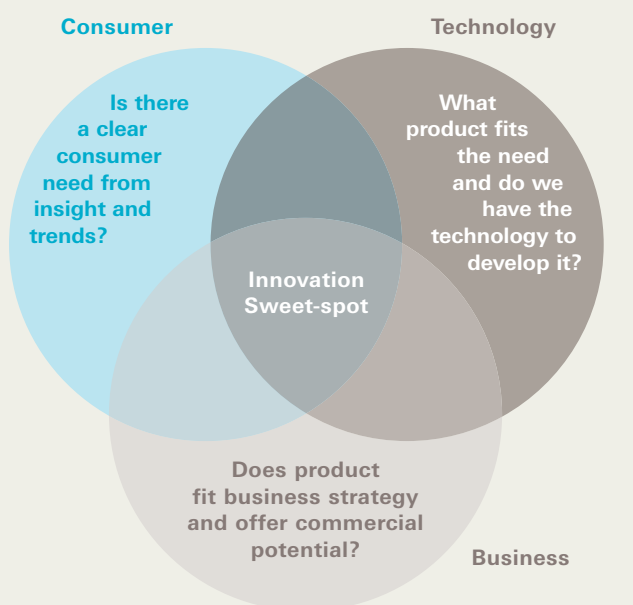
Protecting Nestlé's intellectual property

In today's highly competitive knowledge-based economy, creating and managing intellectual property is critical to success. At Nestlé R&D, we seek to create proprietary technologies and protectable product designs. We have a patent policy strategy to manage our intellectual property and create a competitive advantage for our products both in the short and long term.

Nestlé views intellectual property protection more broadly than just patents. We include the use of trade secrets,

Three imperative criteria for targeted innovation

All new R&D projects must fit three criteria... Confirmed consumer need, technological feasibility, and commercial potential... before practical work begins.



trademarks, designs, publications, and know-how to gain an advantage over competitors. This builds protection fortresses.

Our competitive analysis process helps each product category:

- To map Nestlé emerging technologies and assess their business potential compared with competitors;
- To identify opportunities that enhance and protect Nestlé's emerging assets;
- To pinpoint gaps to be closed through in-sourcing and innovation partnerships;
- To establish our freedom to operate in intensely protected technology areas.

Strategically and comprehensively managing our intellectual property is critical in moving Nestlé towards the vision of the Nutrition, Health and Wellness Company.

Intangibles are the invisible but decisive advantages driving long-term business performance. Already today, they constitute "the competitive edge"; and that role will be even more important tomorrow.

Working with our factories

R&D's responsibility for innovation continues right through to the factory where the new product or process is introduced.

With every innovation, R&D runs extensive trials on a small scale to check the basic engineering principles and operating conditions. Upscaling to factory production volumes is not always easy. So our teams from R&D work with local engineers and Application Groups in the factories to ensure a smooth handover.

The launch of new *Nescafé Cappuccino* (see p. 22) is a good example. No Nestlé factory had any previous experience of the new process. Engineers and food technologists from PTC Orbe (coffee) and PTC Konolfingen (milk powders) teamed up with quality and safety specialists from the Nestlé Research Center. In the factory, they trained the line supervisors, operators and laboratory staff on all



aspects of the new process to assure manufacturing success.

Providing assistance to factories is a continuous task for R&D, both in introducing new products and processes and in maintaining existing ones. R&D people are "on-call" at any time for problems that need their specific competencies.

Scientific and technical support from R&D to the factories is constantly increasing. In 2006, it accounted for 26% of all Food and Beverages R&D hours.

Working with outside partners

Sixty years ago, Nestlé's technologies were limited to a few product categories. Most equipment was developed in house.

Today, Nestlé is active in almost all food and beverages product sectors. The Group emphasis on Nutrition, Health and Wellness has increased the need for rigour throughout R&D and manufacturing. In this ever more specialised world, Nestlé must work with external partners to cement its leadership

in the global evolution of the food and beverages business.

Nestlé's Innovation Partnerships Group has been created to identify, evaluate and bring in added value through external innovation.

Broadly speaking, working with external partners involves five different areas of expertise:

- Universities and research institutes for great in-depth knowledge in strategic disciplines of science where we and they have complementary expertise;
- Industrial partners in joint ventures like Cereal Partners Worldwide or Laboratoires innéov;
- Small start-up companies for innovative technologies, processes or ingredients, where we can see good business opportunities;
- Suppliers of industrial equipment, to personalise it by building in our proprietary know-how;
- Technology owners in unrelated businesses whose know-how can be advantageously adapted to our own needs.

A recent example of working with suppliers is the new carbon dioxide-based freezer for ice cream. This is an integral part of Nestlé's worldwide policy of replacing freezing equipment based on freons. The installation in the Bangchan factory, Thailand, was the first of its kind from any company in a developing country, over 30 years ahead of the international deadline for replacing freons defined in the 1997 Montreal Protocol.

The ongoing challenge

R&D and the Keys to the Future

The higher we aim, the more science and technology we need, and the more precise we have to be in our manufacturing processes. We must ensure the highest levels of product consistency, quality and safety. This means the R&D role goes far beyond its traditional task of innovation and assumes a much greater scope in technology transfer. We must provide the necessary knowledge at all levels from the management to the process-line.

R&D must place ever greater emphasis on Good Manufacturing Practice procedures in safety, quality and hygiene. Providing Nutrition, Health and Wellness means consistently meeting tighter tolerances and more stringent regulations. This “moves the goalposts” in food manufacturing ever closer to the approach of a life science company.

Within this framework, Nestlé R&D has three important tasks:

- **Quality by design**

Building all aspects of quality into new products and processes right from the start of any project. Including everything from the raw materials through to the packaging and the quality of the product at the time of consumption. It means putting in all process controls in the factory to ensure that strict tolerances are met to deliver high quality products.

Nestlé R&D develops many new analytical methods needed to fill the ever-growing demand for product testing from international and national safety authorities. Some of these relate directly to Nutrition, Health and Wellness claims for Nestlé products that offer the competitive edge. Others are non-competitive and touch the whole food industry. In such cases, Nestlé works with food trade organisations and government laboratories to find solutions. Many methods developed by Nestlé R&D become international standards;

- **Product and Process Mastership – knowing everything down to the last detail about our products and processes**

R&D provides continuous training internally and out in the factories on the technical and analytical procedures associated with every product.

To ensure high performing Nestlé factories, R&D expert teams have provided best practices and helped in their implementation. Everybody in the supply chain is responsible for guaranteeing Nestlé quality – scientists, technologists, engineers, supervisors and line operators;

- **Source of scientific and operational human resources**

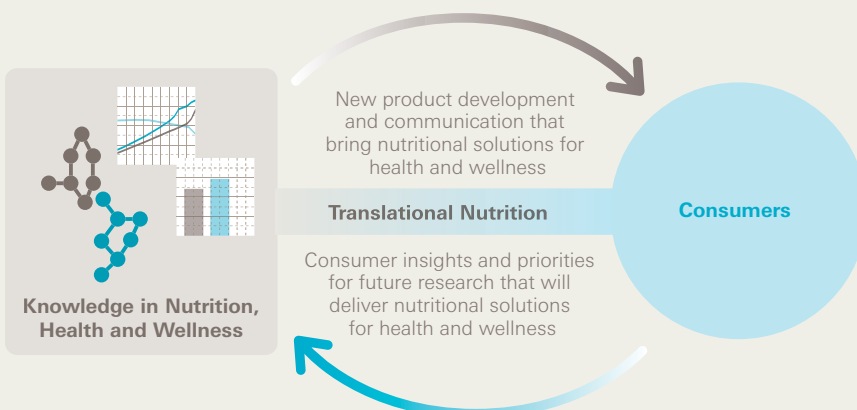
The further Nestlé moves to Nutrition, Health and Wellness, the more people with a scientific background are needed throughout the Group.

Over the past decade, more and more people from R&D have added business skills to their scientific and technological background and continued their careers in the Nestlé businesses, markets and factories. This combination of skills, added to their knowledge of Nestlé, cements R&D – Business interactions, bringing dynamism and efficiency into the innovation process.

The goal is to aggregate all Nestlé’s skills and expertise in the drive towards an ever more personalised nutrition. An approach that further strengthens the Group’s relationship with each individual consumer.

The base of personalised nutrition in the food industry

This bridges the gap between nutrition research and business. It fast-tracks the transfer of innovation to consumers and drives forward a strategy for consumer-relevant research.



The synergies of teamwork

Working with the Businesses

However good at innovation R&D may be, it can never work in isolation. The close working partners include the eight Strategic Business Units, the three Nestlé Global Businesses and the three geographical zones – Europe, the Americas and Asia-Oceania-Africa. Together with them, R&D defines the projects and innovation pipelines for today and the future.

Putting the consumer first needs intensive teamwork between R&D, the Strategic Business Units, the Nestlé businesses and the markets

“

Teamwork is essential. For each of its four sectors – Infant Nutrition, HealthCare Nutrition, Performance Nutrition, and Weight Management – Nestlé Nutrition has business specialists, R&D experts and technical experts sharing the same offices

”

Thomas Schweizer
Head of R&D Nestlé Nutrition

Working with Nestlé Nutrition – an example of teamwork in practice
Nestlé Nutrition offers branded products and services that deliver recognised nutritional benefits. These meet the specific needs of well-defined consumer segments. Its brand portfolio covers Infant Nutrition, HealthCare Nutrition, Performance Nutrition, and Weight Management.

To serve its consumers even better, Nestlé Nutrition has put in place a R&D-based innovation process. This generates the science-driven innovation that meets specific nutritional needs at particular stages in consumers' lives. It demands close co-operation between Nestlé Nutrition, R&D and the factories.

The Nestlé Research Center plays a pivotal role. It is the source of the basic research that drives nutrition innovations. It substantiates the nutritional and health-related claims of Nestlé Nutrition products. It provides the scientific framework for Nestlé Nutrition's product quality management.

Nestlé Nutrition taps into the product expertise from several Product Technology Centres: PTC Konolfingen (CH) for infant formulas and healthcare nutrition products; PTC Orbe (CH) for infant cereals and performance nutrition products; PTC Singen (D) for baby foods in jars.

The strong link between R&D and local application groups in factories is key. It ensures that Nestlé Nutrition meets its own strict global quality requirements as well as all international, national and local safety and regulatory standards.

The close relationship with Nestlé R&D is critical for Nestlé Nutrition to strengthen its brand portfolio with innovative nutrition solutions that deliver clear benefits for its consumers.





The Driver Team for Shelf Stable Dairy Products identifies the social and consumer trends driving Nestlé's innovations for today and the future



The Super-Premium Brand Team for Petfoods brings together R&D, Strategic Business Units and the US and European Markets to keep a constant project flow in the pipeline

The Nestlé R&D Top Management Team (left to right): Prof. Peter van Bladeren (Head of Nestlé Science & Research), Prof. Werner Bauer (Chief Technology Officer), Dr Klaus Zimmermann (Head of Product Technology and R&D Centres)



The Nestlé research community is working closely with the best scientists and key research institutes around the world. (left to right) Prof. Bruno Vellas (University of Toulouse, France), Prof. Peter van Bladeren (NRC) and Nobel Laureate, Prof. Erwin Neher (Max Planck Institute Goettingen, Germany)



The Innovation Team for Coffee & Beverages sets goals for new products that fit consumer trends and core technologies



The Ice Cream Training Centre in PTC Beauvais runs regular workshops for people working in Nestlé Ice Cream worldwide giving them all communication tools and support to apply in their local markets

R&D from the inside

Looking inside Nestlé R&D reveals research laboratories, pilot plants, sensory testing kitchens, engineering workshops. The scientists, technicians and engineers who work in them, are the generators of Nestlé innovations. To get the best that advanced science and technology has to offer in Food, Nutrition, Health and Wellness calls for the combined skills of people at all levels in Nestlé R&D.

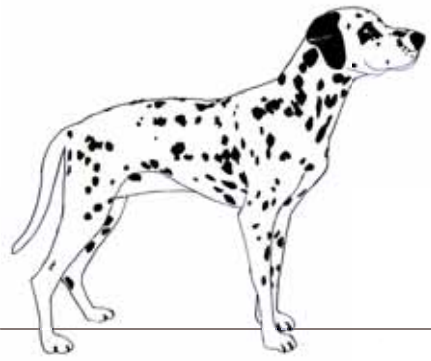




Among views in Nestlé R&D, the photograph above shows the EPFL team (Ecole Polytechnique Fédérale de Lausanne) working on the joint Brain Research project with the Nestlé Research Center



From consumer insight to products



In R&D, we keep the consumer at the centre of our activities to drive relevant innovations that bring out the best in nature

What do consumers want from their foods?

For success, consumers have to buy and enjoy Nestlé products. This simple truth is at the core of all we do. Putting consumers first means identifying their needs, translating these into tangible consumer benefits, and then creating products that supply those benefits.

Today's consumers want more than basic commodity products. They are aware of the impact of food on their health. They are looking for products that go beyond convenience and taste.

Consumers want products "wherever, whenever and however" that they fit into their changing life-styles – with more out-of-home consumption and eating-on-the-run. And there are always new heights of pleasure, enjoyment and sensory delight to scale.

Consumers are looking for the added value in Nestlé products. They need a "win-win" relationship with the Group. This is why putting the consumer first is a vital parameter in the way R&D brings added value to all Nestlé businesses.

How can R&D develop technology that brings out the best nature has to offer?

How can we make an ice cream with less than half the fat that gives the same creamy texture as regular premium ice cream? Or an instant cappuccino with a foamy topping like a traditional Italian cappuccino? Or bread and pastry dough with yeasts that "hibernate" in the fridge and re-awaken when it's time to put them in the oven?

The answer is through innovative technology. The very nature of foods imposes strict limitations on industrial food processes. Food raw materials are of biological origin. They contain essential nutrients that have to be preserved or even enhanced, all the way to the final product. For the best results, we need the best technologies and the best ingredients.

The challenge involves working in a narrow window of manufacturing conditions that generate sensory qualities whilst, at the same time, providing full nutritional value and absolute safety.

This demands the same degree of scientific and technological excellence and creativity as the more obviously high-tech industries like telecommunications or aerospace. It allows Nestlé to offer consumers a mix of benefits from their foods and beverages. Great taste! But also quality of life through Nutrition, Health and Wellness. Plus the traditional benefits of convenience and value for money. Enjoyment and indulgence, even fun, are key drivers for some consumers. For others, the main motivation is good food at an affordable price.

In summary, R&D must identify the science, create the technologies and develop the products that fulfil these complex and changing consumer needs

all over the world. Working closely with business and market colleagues, we keep the consumer constantly at the centre of our universe.

The following pages present eight examples of innovative Nestlé products. They well illustrate how we go about meeting technical challenges to develop solutions that meet real consumer needs.

Q.

Wouldn't it be great if I could have a real Italian cappuccino coffee, right here? Instantly!

Cappuccino lovers want their cappuccino to be exactly like it is in Italy, but they want it now – whenever and wherever they are



A.

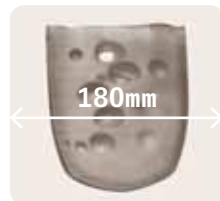
Nescafé Cappuccino with Foam Booster

Nescafé Cappuccino: creating the real Italian experience – instantly

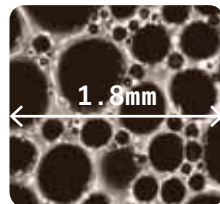
Understanding cappuccino drinkers Italian cappuccino has set the standard for consumers all over the world. Gently pouring steam-frothed milk on the surface of brewed coffee gives a white, milky foam on top of rich brown coffee. The Italians call it “cappuccino” because it’s like the capes of Capuchin friars, with their shaved white heads standing out from their brown habit.

It’s the foam that makes the difference. To enjoy a perfect cappuccino, you go to a café, or have your own machine at home. That’s because until recently, instant cappuccinos have not been able to match this standard.

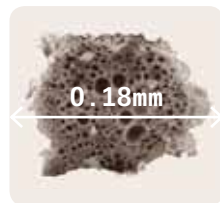
From understanding to actionable insight These days, busy consumers want to enjoy their cappuccino instantly. But they want the real Italian coffee experience, wherever they are. The challenge for Nestlé R&D was to create a product that captured the magic of Italian cappuccino.



Emmental cheese



Cappuccino foam



Foam Booster

Small is beautiful: The holes in the Foam Booster are one million times smaller than a hole in an Emmental cheese

From insight to product Increasing consumer awareness about cappuccino values led us to evolve the first, extremely successful, generation of Nescafé instant cappuccino. Clearly a new product was needed with much denser, longer-lasting foam.

From concept to production Nestlé R&D studied the science of foams and how to make them last “just long enough” to satisfy the most devoted cappuccino drinker. The spark came with the development of a totally new technology – the “Foam Booster”.

Unique technology Foam Booster granules are tiny particles of specific carbohydrates and proteins full of minute holes. The holes are filled with nitrogen gas – which is the main component of air – at a very high pressure.

How it works Nitrogen is trapped in the Foam Booster at about 35 times atmospheric pressure – 15 to 20 times the pressure in car tyres. In hot water, the nitrogen is released, lifting the creamer to the surface to form an instant milky foam. The coffee stays below to form the brown base. The result? A perfect cappuccino.

Teamwork in action To create this break-through, we had to draw on skills from many R&D resources: the Nestlé Research Center for innovative physics in turning the Foam Booster concept into reality; PTC Konolfingen for controlled booster porosity; PTC Orbe for filling the booster with nitrogen; and the Boué factory in France for manufacturing the booster in industrial amounts.

The ultimate satisfaction The consumers’ dream has become a reality. Thanks to our innovative science and technology, cappuccino lovers anywhere can now recreate the Italian cappuccino experience, but in an instant. In every country where new Nescafé Cappuccino has been launched, sales have rocketed.

Sustainability in production As in all Nescafé factories, residual coffee grounds are incinerated as a renewable, carbon-neutral fuel to power the production lines. This conserves non-renewable fuels, limits greenhouse gas emissions and prevents waste generation.



Q.

Can I have an ice cream which is lower in fat and calories and tastes as good as my favourite?

I eat light ice cream sometimes, but I know I'm compromising on taste. It makes me feel as if I'm settling for second-best



A.

Dreyer's Slow Churned Rich and Creamy ice cream

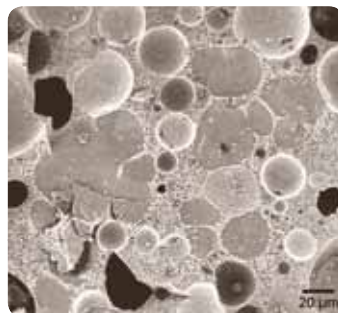
Dreyer's Slow Churned Rich and Creamy... a miracle come true: lower fat and calories but full taste

Understanding the consumer
The craze for light foods began in about 1980 when increasing consumer awareness of the effects of food on health fuelled a growing demand for low-fat, low-sugar and low-calorie varieties. But fat contributes significantly to flavour and texture. So, compared with regular products, consumers often perceive light products as inferior. In the US, where ice cream is seen more as a food than a treat, most ice cream lovers carried on eating full-fat products.

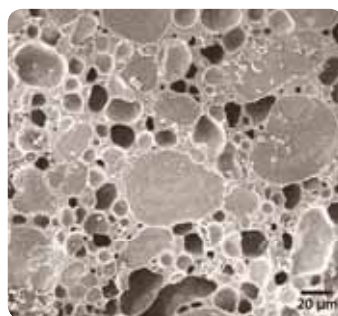
From understanding to actionable insight What was holding the consumer back was the absence of a desirable alternative to full-fat ice cream. If only someone could create an ice cream with less fat but no sacrifice in pleasure, then that would be a miracle... the best of both worlds.



Under the microscope: Dreyer's Slow Churned light ice cream has a finer structure and texture than regular ice cream



Conventional ice cream



Dreyer's Slow Churned

From insight to product
It was only in the 1990's that technology was developed to make low-fat ice cream with the same rich texture and taste as regular ice creams. First, Nestlé in Switzerland and then Dreyer's in the US worked on a process called "extrusion freezing". Nestlé was already using extrusion cooking for breakfast cereals. The challenge was to transfer the technology from cereals to ice cream, in effect by turning the extrusion-cooker into a freezer.

It took R&D almost a decade to perfect the technology. The secret? By "destabilising" the tiny fat droplets in the product, half the fat goes twice as far. This changes the ice cream's microstructure so that it feels and tastes the same as full-fat ice cream.

The consumer at the heart of all we do With the guidance of PTC Beauvais, extrusion freezing was first used in Spain to make ice creams with novel shapes. Dreyer's R&D also used it for their new Slow Churned Rich & Creamy product – an ice cream with half the fat and a third fewer calories. Working with consumer feedback, they perfected it. At last, consumers had a truly light product – yet with all the pleasure of the old, full-fat, regular ice cream.

The ultimate satisfaction R&D innovation has satisfied a major consumer need. This first light ice cream with full taste, texture and pleasure, has been hugely successful with consumers in the US. Sales are increasing by over 50% per year. It proves that the product fulfils the promise in its advertising that it delivers "the original, unexpected and exciting sensory experience". Nestlé now has global patents, covering both the technology and the products.

Q.

We love the taste of fried noodles. But are they healthy?

We want the same fried and salty taste as full-fat fried noodles, but they have to be healthy too. In other words, can we have the fried and salty tastes without frying?



A.

2-Minute noodles with 25% less salt and 75% less fat, but 100% taste

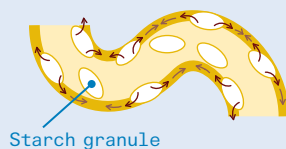
Fried noodles, but without frying! That takes innovative thinking

Understanding noodle eaters
4000 years ago the Chinese were already eating noodles. Today, wheat noodles are still one of the most popular foods in Asia. They're affordable, easy to prepare, can be eaten hot or cold, and they're filling. Generations of parents have given them to their children as a staple food.

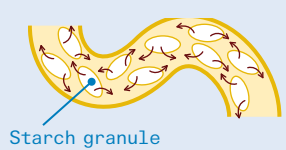
But in Asia today, instant noodles are beginning to have an unhealthy image. They're becoming associated with too much salt and, because most of them are fried, too much fat and too many calories. These nutritional concerns, along with fears of obesity, have led some school authorities to take fried noodles off the menu, and to discourage parents from feeding them to their children.

From understanding to actionable insight Our experts in Nestlé R&D Singapore identified two apparently conflicting demands: consumers want healthy foods, but they also want noodles with the salty and fried taste they like so much.

Standard noodles



Texturised noodles



Non-stick noodles:
Cooking standard noodles deposits sticky starches on their surface.
Texturised noodles hold the starch inside

From insight to product

Two main challenges faced the Nestlé R&D noodle team – to lower salt and fat without changing the taste; and to re-establish the image of instant noodles as “healthy eating”.

They knew that by meeting these challenges, the scope for growth in noodle sales could extend to countries beyond those with noodle-eating cultures.

From concept to production

Meeting consumer demands for the salty, fried taste, while delivering health and nutrition benefits, placed this project firmly in Nestlé's 60:40+ initiative.

New recipes were developed. Part of the sodium was replaced with potassium. Other ingredients were used to enhance the taste of the smaller amount of salt that was left.

A totally new process replaced the frying of noodles. Drying them in a stream of very hot high-velocity air reduced the fat, but also took away the fried taste. Further research identified the components in noodles that generate this desired taste. These were used to create a natural “fried flavour” concentrate which was then added as an ingredient to the air-dried noodles. The new recipes also prevented the noodles sticking together.

Satisfying consumer needs

The team reduced salt content by about 25% and fat by at least 70%. On top of this, noodle lovers can still enjoy that full fried taste and non-stick texture they love.

The ultimate satisfaction

Nestlé is the first to market instant noodles with a clear 60:40+ taste preference and health benefits of lower salt and fat. Nestlé is also the first to launch instant noodles in the huge market of India.



Q.

Can you give me
coffee I can savour
like a fine wine?

I'd like the full sensation of the world
of coffee with every cup I drink



A.

Nespresso: encapturing the magic of fresh roast and ground coffee

An incomparable coffee experience right at your fingertips

Understanding coffee drinkers

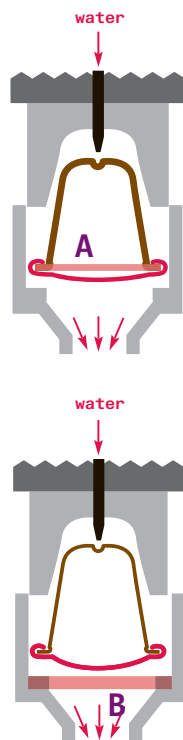
Coffee connoisseurs enjoy the rich taste and aroma of fresh-brewed coffee. But coffee has always had something special about it. Traditionally, the Mediterranean or South American taste preference is very different to the German, Scandinavian or North American taste preference. But, as with fine wines, different tastes bring different pleasures.

From understanding to actionable insight

At its creation in 1986, the Nespresso Company probed deeper into what drives coffee lovers. Beyond regional variety, consumers wanted a choice of high quality blends to suit their different coffee "moods". Restaurants, airlines and other FoodServices sectors also looked for variety to meet the individual desires of their clients.

Meeting a consumer need

In 1975, the Nestlé PTC in Orbe (CH), began work on developing coffee capsules and extraction system that combined fresh roast and ground quality with fingertip preparation. *Nespresso* was born! Consumers loved it.



Invisible secret: In new-generation capsules, the original one-cup internal filter (A) is replaced by a multi-cup external filter (B)

From insight to product *Nespresso* constantly presents its devotees with an ever-wider choice of coffees. Different origins, blends and roasts suit all occasions and moods. For the espresso machines, R&D has worked extensively with makers of home and professional kitchen appliances. Beyond the premium taste, the pleasure of *Nespresso* is enhanced by the design of these machines and accessories that bring a touch of visual elegance to any surroundings.

This eye for aesthetic detail, synonymous with the highest quality, comes from some of the world's best interior designers. They bring the beauty of "avant garde" design, to complement *Nespresso's* super premium image, in the ultimate coffee experience.

Fashioning the capsule

Capsule technology has seen spectacular advances. The first capsules had thick, aluminium walls with a built-in coffee filter. To develop an efficient seal that could support the high water pressure needed for a top quality brew without bursting took R&D about three years! Today's capsules have thin aluminium walls and the filter is built into the capsule holder.

The Nespresso AAA Sustainable Quality programme

Nespresso works in partnership with the NGO Rainforest Alliance to support economic, social and environmental development for small-scale coffee farmers and to ensure best farming practices in quality, cultivation and productivity. At the level of the end-user, *Nespresso's* recycling system for used capsules is an integral element in Nestlé's commitment to eco-friendly processes and products.

The quest for the ultimate cup

The constant drive for perfection makes *Nespresso* "the ultimate coffee experience". With sales increasing by about 35% per year and now exceeding one billion Swiss francs, it is one of the fastest growing brands in the Nestlé Group.



Q.

Can you help my baby be the best baby ever?

Mothers who can't or don't wish to breastfeed their baby don't want second best. Understandably, they want an infant formula as close as possible to mother's milk, the undisputed gold standard



A.

Nestlé Infant Formula: a century of progress in infant nutrition

Nestlé Infant Formula: fulfilling mothers' and babies' needs

Understanding babies' needs

In their first few months, babies' needs for food and nutrition are very different from at any other age. They feed, then they sleep. This way, they channel all their energy and the nutrients they consume into their growth and development.

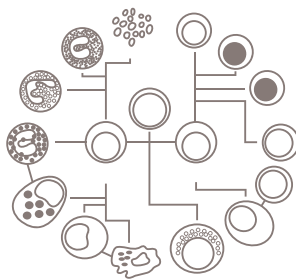
Babies grow visibly. They double their body weight in four to five months, and triple it in a year. At birth, the brain accounts for 17% of total body weight. In 18 months, it grows almost to adult size.

The first months are also critical for development of other vital organs such as the liver, heart and kidneys. A baby's stomach grows from about 30 ml to 120 ml in its first month. Digestive enzymes then develop and, from about six months, babies can begin to eat solid foods.

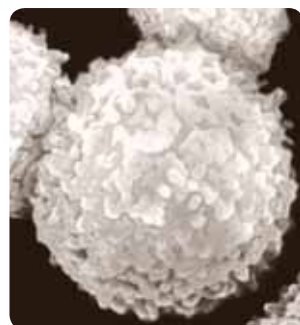
From understanding to actionable insight In the early months, milk is the only food babies can easily digest. Breast milk is best, but infant formula also has to provide all the nutrients needed for growth and healthy development.



Enhanced immune defences: New Nan creates a protective intestinal flora similar to mother's breast milk



Immune system cells



Lymphocytes

The consumer at the heart of all we do Babies' needs are universal and natural. To meet them, Nestlé infant formulas must provide "total nutrition". However, Nestlé Nutrition, along with R&D, also has to address mothers' needs.

From insight to product Nestlé Nutrition believes, and states, that the best food for babies is mother's milk. It provides components that nourish, protect and develop infants. But for mothers who cannot feed their baby, or don't want to, Nestlé has a range of high quality infant formulas that complement or substitute breast milk.

From concept to production Ever since Henri Nestlé's first baby food in 1867, advances in scientific knowledge have continuously led to new generations of infant formulas, mainly as a result of developments in infant metabolism and physiology at

the Nestlé Research Center, and new milk processing technology at PTC Konolfingen. Protein pre-digestion technology has led to hypoallergenic (HA) products that prevent allergies. Certain polyunsaturated fatty acids contribute to the development of the still immature immune system of the growing infant.

A process to enrich cow's milk in soluble whey proteins has given Nestlé infant formulas a protein content and essential amino acid profile very close to mother's milk.

Revolutionary technology has been used to dry living probiotics bacteria. The resultant powder retains all their health benefits, and means that infant formulas build up an intestinal flora similar to that of breastfed infants. This helps to stimulate the immune system and reduces the frequency of diarrhoea.

The ultimate satisfaction In spite of the incredible complexity of premium infant formulas, constant innovation is leading to Nestlé products that are closer than ever to mother's milk in terms of both their composition and functionality. Mums and Dads can be fully satisfied and reassured that their baby is getting an excellent start in life through the best possible infant formula – the product of over a century of advances in the science of infant nutrition.

Q.

How about a bottled water that really appeals to children?

To get kids to drink healthy water instead of sugared, carbonated soft drinks, you have to make water fun



A.

Aquapod: built on the very novel PLOC shape

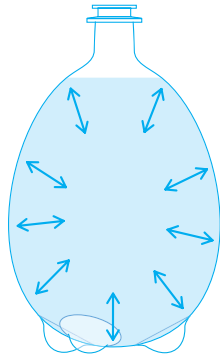
Nestlé Waters North America AQUAPOD: Kids love it!

Consumer background

Bottled waters must be safe, pleasant to drink and conveniently packed. More and more water is consumed on-the-go in small, readily available, one-shot sizes. Countries with emerging economies, such as Africa, Pakistan, Southeast Asia, and China want products that are affordable and accessible. Globally, demand is increasing for healthy water drinks as an alternative to high-sugar carbonated soft drinks, especially for growing children.

From understanding to actionable insight When you have a good water from a good source, you don't change it! So the main challenge for innovation is to focus on the bottle, and build in affordability and identity. This is particularly appropriate for Nestlé Waters' smaller bottle range.

Affordability PTC Waters in Vittel, France, first looked at how to reduce bottle weight, and therefore its cost. They wanted a "super-light" bottle that would be self-standing and strong enough for distribution. Then they pushed the thinking further. How about a completely new bottle shape?



Egg power: The ovoid bottle gives strength through even distribution of forces. Its attractive shape enhances product image

From insight to concept

This led Nestlé Waters to develop "PLOC" (Plastic Light Ovoid Container) – an egg-shaped, strong bottle combining practicality with novelty.

The strength of PLOC

The PLOC bottle has a continuously curved, paper-thin, flexible wall. Filled with water, it is almost incompressible. An infinite number of tiny forces spread any pressure evenly over the whole surface.

The ultimate satisfaction

PLOC in Nigeria makes savings in packaging costs, which can be passed on to the consumer. Bottle walls are 0.05 mm thick compared with 0.2 mm for regular bottles. So three bottles can be made with the same amount of PET. Since 2002, Nestlé has saved 354 thousand tonnes packaging material used for bottled water.

In Nigeria, the PLOC bottle was launched to meet the need for a readily available and affordable good quality water. But consumers perceive it as much more. This led PLOC to be renamed as "BLOM" (Bottle; Light weight; On-the-go; Market). BLOM reflects its wider appeal – not only its overall good value and its unique balloon shape, but also its functional on-the-go, everyday consumption ranging from social/sports events to children's lunch packs.

Identity: The power of shape

Breaking away from the old straight-walled bottle, the new PLOC shape clearly had a huge potential to make water fun. In North America, they realised that its innovative format and new identity were perfect for targeting children.

The result was *Aquapod* – a new water brand just for kids. They love it. They now have "a bottled water just for them". It's not what their parents drink so it appeals to their sense of independence. Above all, it offers an alternative to sweetened carbonated soft drinks, helping children to enjoy a healthier, better balanced diet.

It's no wonder that PLOC and *Aquapod* have quickly proven to be a sales-winning formula.



Q.

How can I look beautifully suntanned and help my skin to be healthy too?

Lots of women want a suntan but don't want to harm their skin in getting it



A.

New generation *innéov Solaire* with Skin Probiotic

New *innéov Solaire* with Skin Probiotic: now you can sunbathe and benefit the skin

Understanding the consumer

Lots of women want a quick, even, lustrous tan. But they know that the sun can harm them. They want their skin to stay moist and supple while they're sunning themselves, and certainly no blemishes or wrinkles.

Existing "instant tan" lotions from the 1970s used beta-carotene to colour the skin. This often gave an unnatural and uneven orange colour. Consumers wanted something much better.

Meeting consumer needs

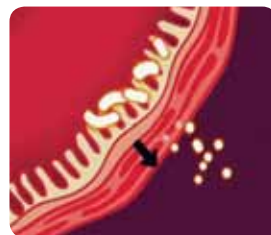
The challenge was to provide effective tanning with maximum protection. A faster, better quality tan – especially for those who find it difficult to tan, and much more effective against the sun's UV rays.

Developing the product concept

Laboratoires innéov is a Nestlé-L'Oréal joint venture for cosmetic nutritional supplements, or "nutricosmetics". State-of-the-art research in nutrition and dermatology has given a totally innovative product that develops a high quality tan and strengthens the skin's cellular defences at the same time.



Cellular defences



Skin Probiotic induction

Skin Probiotic reinforces skin natural defences. It directly interacts with the intestinal cells and induces messengers that activate skin cellular defences



Nestlé: the pioneer in probiotics Over 25 years of research in Nestlé have proved the beneficial effects of natural bacteria, the probiotics, on human health – for the intestinal flora, the immune system and in preventing allergies. Nestlé's first product with probiotics was the yoghurt-like *LC1*. But anybody can make a yoghurt, so Nestlé research has developed many new uses for probiotics. One of these is in products that promote skin health and beauty.

Unique Skin Probiotic

The break-through was the discovery of a Nestlé probiotic that helps protect the skin against UV, but can be consumed orally in a nutritional supplement rather than applied as a skin lotion. It works from inside the body to enhance the skin's natural immune defences, and to accelerate cell regeneration.

How it works In the body, *Skin Probiotic* creates tiny amounts of health-promoting substances that circulate in the blood stream. When they reach the skin, they activate the immune defences. It is the only probiotic clinically proven to have a positive effect on skin exposed to UV. In five clinical studies, new *innéov Solaire* with *Skin Probiotic* even exceeded the objectives. After UV exposure, skin cells regenerated in four days compared to ten days without it.

The ultimate satisfaction

Women can now tan in the sun with less worry of harming their skin. With new *innéov Solaire*, Laboratoires innéov has established a clear brand preference: 90% of women judge it totally effective compared to an average of 63% for competitive brands. 94% said it gives a better tan and 77% rated it as effective against premature ageing.

Launched in 12 European countries, it's no wonder that over nine million capsules have already been sold.

innéov Solaire is intended as a complement to sun protection cream, which is vital. Sensible and appropriate behaviour in the sun is also essential.

Q.

What can I give my cat to ensure a longer healthier life?

Cat owners want their cats to live longer, but only if their cats can enjoy a healthy quality of life



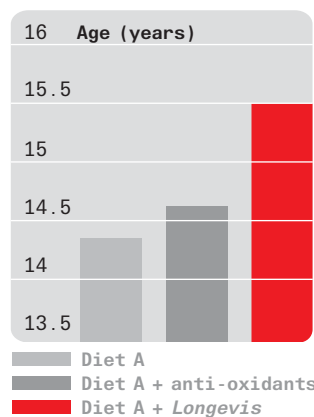
A.

New Pro Plan Vital Age 7+ with Longevis

Pro Plan Vital Age 7+ with Longevis: Proven to extend a mature cat's healthy life

Understanding cat owners
Cat owners have a very close relationship with their pets. Cats are part of the family, but they live a short life. It's understandable that their owners will do what they can to help their pet live longer. But as cats get older, their quality of life begins to suffer. Quality of life is as important as length of life.

From understanding to actionable insight
Purina scientists, vets and nutritionists know more about cats and pet nutrition than anyone. They realised that any product they developed to help cats live longer should also have to ensure a healthy life into "old age".



Nestlé Research Center has recently proven that cats aged 7 years plus, when exclusively fed Longevis live up to 1 year longer



From insight to product
A cat's nutritional needs change with age. As they become "seniors", many of them are less able to chew and digest food. Ageing also affects the heart, kidneys and digestive system, and lowers the protective effect of their skin and coat. Any new product would need to address all these age-related issues.

From concept to production
Nestlé Research Center scientists and Purina nutritionists developed a nutritional strategy covering all aspects of longevity and health. They were looking for a unique blend of ingredients that would prolong life and enhance its quality. They identified the key ingredients; they determined the optimum quantities of each needed in the food; they developed processes to ensure ingredient stability during manufacturing and storage, as well as to guarantee product consistency and effectiveness.

Unique Branded Active Benefit
The proprietary Longevis "BAB" is an exclusive Purina blend of ingredients that helps delay the first signs of ageing. It was specially formulated for Pro Plan Vital Age 7+ cat food products. Longevis helps to maintain a balanced microflora for better intestinal health, and enhances a cat's immune response.

How it works
With age, a cat's body cells lose the ability to repair and regenerate themselves. This effect is

accumulative and can shorten the cat's life. The antioxidants in Pro Plan Vital Age 7+ increase cell defences and speed up repair. They also help to protect skin against damaging external environmental factors.

Prebiotics supply nutrients to the intestinal microflora and encourage healthy digestion. The polyunsaturated linoleic acid improves skin and coat quality and further protects the body during ageing. The product is completed with protein and phosphorus to maintain muscle mass and kidney function.

Palatability
Mature cats often lose interest in food. Taste and texture are vital in getting them to eat and stay healthy. Pro Plan Vital Age 7+ has appetising easy-to-chew and easily digestible nuggets that also contribute to oral health and reduce tartar build-up on teeth.

The ultimate satisfaction
Purina's longevity study has proved that cats aged seven years or more live significantly longer and in good health when they are fed exclusively on a diet enriched with Longevis. Now, thanks to Purina R&D, and the launch of Pro Plan Vital Age 7+ across Europe, many more cats are happily living longer. There are also many more very contented owners.

Working for the consumer
of today and for the
world of tomorrow



This booklet shows how Nestlé R&D thrives on the complexity of our industrial operations, our business challenges, and the consumer expectations we must meet to be the leader in Nutrition, Health and Wellness.

Key success factors for today and the future are to keep the consumer firmly at the centre of our innovations and strengthening the partnership with our businesses and markets.

In this partnership the SBUs and Nestlé businesses are the strategic drivers, R&D supported by the Application Groups are the providers and innovators, and the markets and factories are the implementers.

Consumers want health and wellness from their foods. They want fun, freshness and flavour. But they also want a feeling of wellbeing. In providing this, Nestlé R&D must know as much about consumers as about food. How do different nutrients and food components interact within the body to exercise their beneficial effects? Can we enhance these effects? And how much does individuality affect interactions?

At a societal level it also means a better understanding of broader human needs. For example, how can nutrition delivered by excellence in foods and beverages limit the upward spiral of health costs by enhancing health and wellbeing.

R&D must look to the future. We need clear roadmaps and strong pipelines for today and tomorrow. But to really stay on top, we have to think beyond a time horizon of two to five years, and look ten to fifteen years ahead. How will new sciences like nutrigenomics influence society and our individual life? What opportunities will the new sciences give Nestlé? Will they open the way to personalised nutrition? We need to be involved early, act at the right moment and steer the course successfully.

A final word for the force that drives us – our consumers. We always put the consumer at the centre. We define consumer needs and transform these into products that deliver appropriate consumer benefits. The guarantee from Nestlé R&D is reproducible high quality products every day, everywhere at the right cost. These are our R&D messages for today and the future.

Concept and design
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