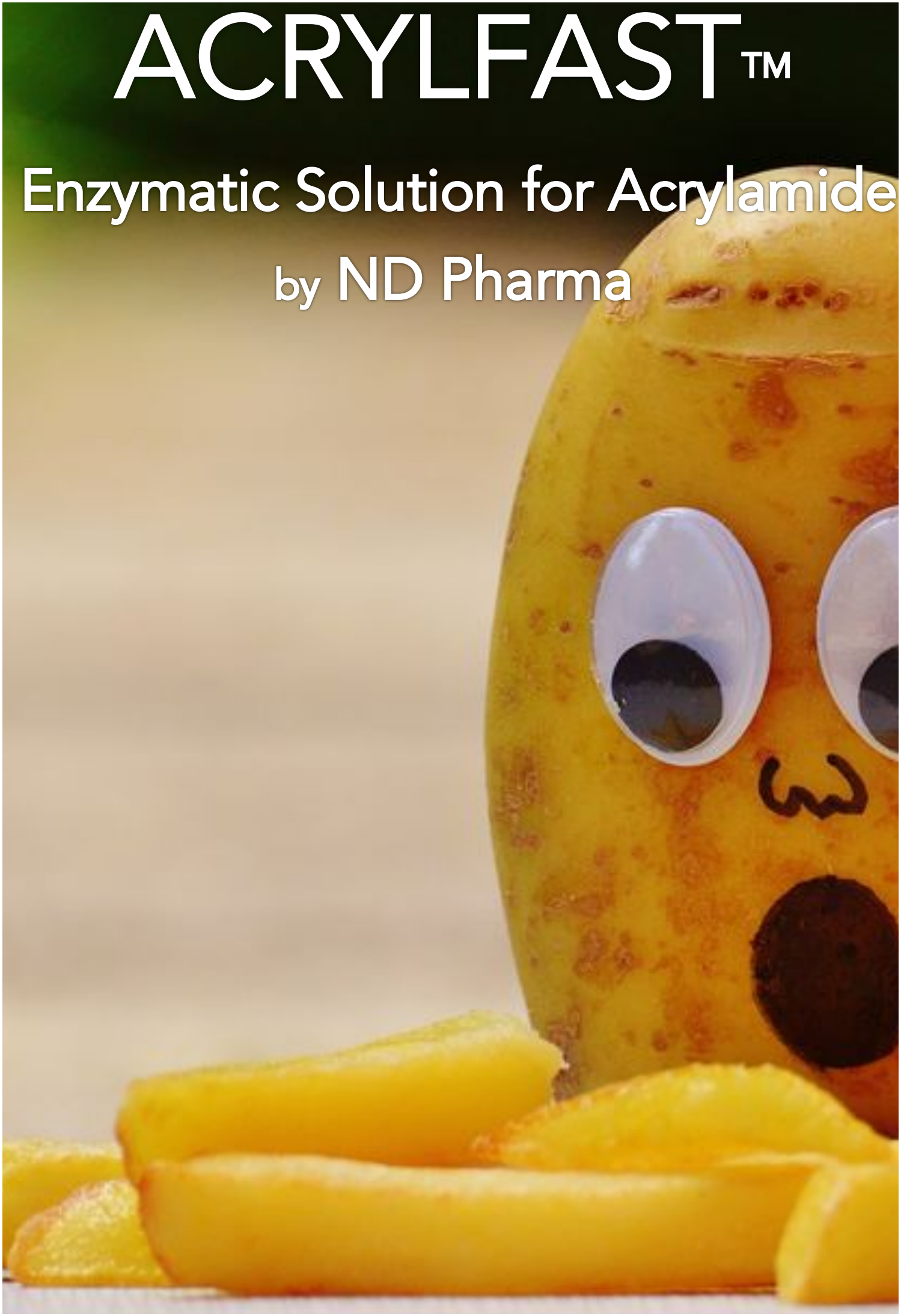
ACRYLFAST™

Enzymatic Solution for Acrylamide

by ND Pharma



With the announcement in 2002 that researchers have found acrylamide in food, consumers wonder whether common foods such as French Fries and potato chips are safe to eat. Consumer groups attest that hundreds of cancer cases per year are attributable to acrylamide; the food industry disputes this claim.

Meanwhile, the international scientific community is racing to determine if acrylamide has harmful human health effects. We discuss the current state of knowledge about acrylamide and potential regulatory responses that government agencies might consider.

What Is Acrylamide?

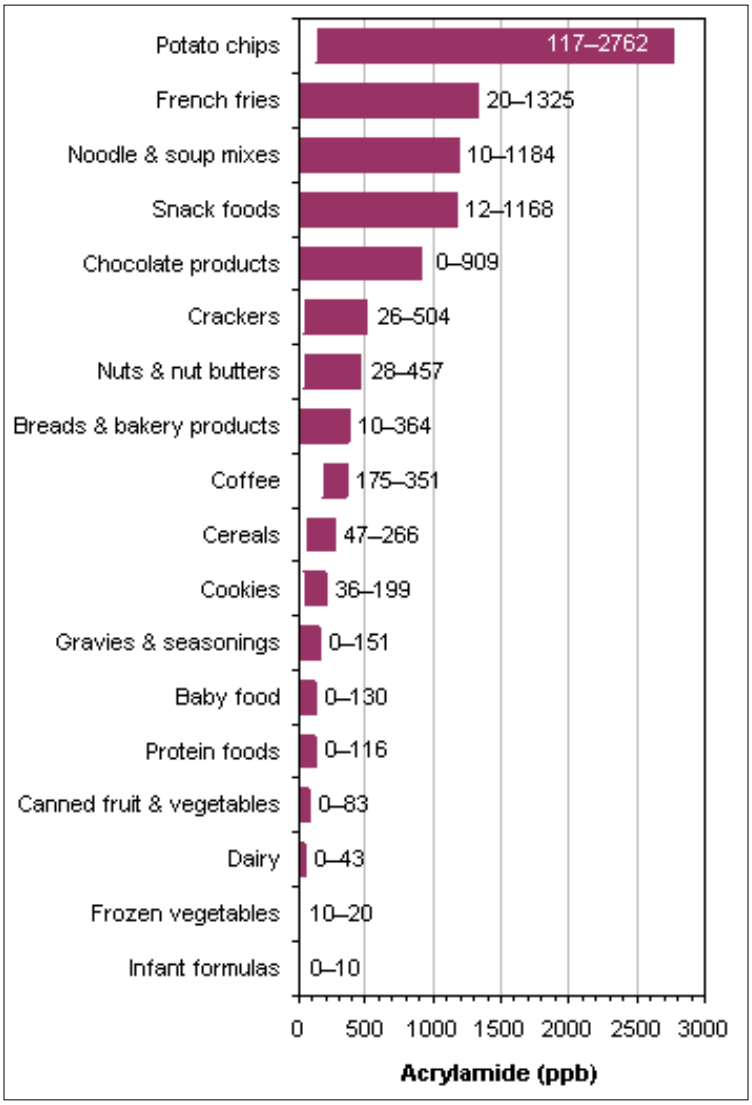
Acrylamide is an organic chemical recently found to occur naturally in certain food products. It has long been used for industrial purposes, in producing polyacrylamide gels, and as a grouting agent in construction. Polyacrylamide is used as a papermaking aid, as a soil-conditioning agent, in ore processing, in sewage treatment, and occasionally as an additive for water treatment (FSA, 2002). Acrylamide is also a known component of cigarette smoke.

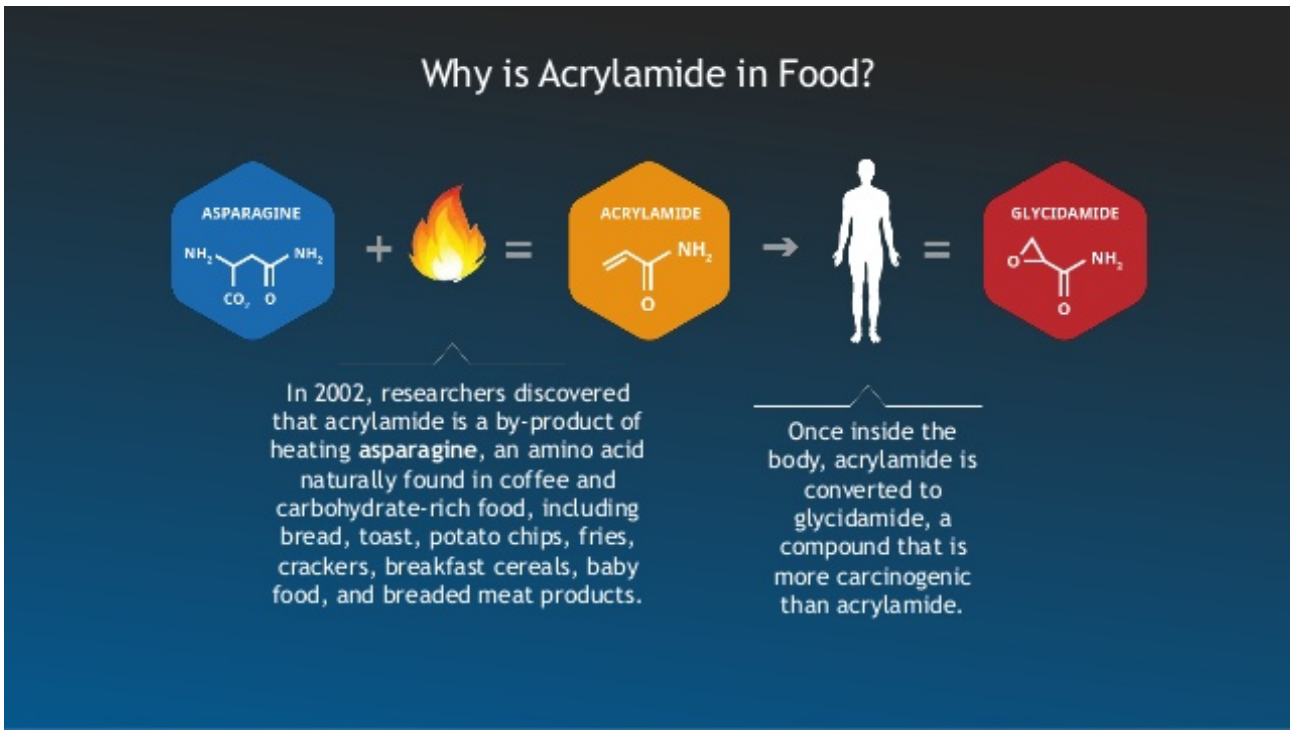
How Was Acrylamide Found in Food?

In April 2002, Swedish researchers announced their discovery of acrylamide in food. In a study analysing the health effects of acrylamide exposure at a railway tunnel construction site in Sweden, both the control group and the workers in the study showed high levels of acrylamide in their bodies. This prompted further research on how acrylamide could be present in the control group, eventually leading to the discovery of acrylamide in food (FSA, 2002). That finding was confirmed later, by researchers in Great Britain, Norway, Switzerland, and United States of America, (FDA, 2004).

How Is Acrylamide Formed in Food?

Acrylamide arises in food when asparagine, an amino acid, is heated with sugars such as glucose. According to the Center for Food Safety and Applied Nutrition (CFSAN) at the Food and Drug Administration, acrylamide is "a natural by-product of the cooking process." The cooking processes that produce acrylamide are baking, frying, grilling, and toasting, or any cooking method in which temperatures are greater than 120°C or 248°F.





What Food Products Contain Acrylamide?

High-carbohydrate foods baked or fried at high temperatures (greater than 120°C or 248°F) contain the highest levels of acrylamide. FDA consumption surveys show that eight food items contribute to the highest levels of acrylamide intake: potato chips, two brands of french fries, breakfast cereal, toast, soft bread, cookies, and brewed coffee (Gilcrest, 2003b).

Acrylamide is not found in raw or boiled foods that are high in carbohydrates, nor is it found in meat, fish, chicken, or infant formula. Furthermore, as more testing is done, it appears that acrylamide levels are highly variable across brands of the same food type and even within the same brand of food. For example, in a popular brand of potato chips, acrylamide levels in 25 bags varied from 249 to 549 parts per billion (FDA, 2004).

What Are the Human Health Risks of Acrylamide?

At this time, the risks of acrylamide through the diet are uncertain. Acrylamide is a known carcinogen in laboratory animals, impairs fertility in male animals, and causes nerve damage to humans exposed in the workplace (FSA, 2002). Epidemiological studies conducted on persons with occupational exposure to acrylamide did not show an increased risk of cancer through acrylamide exposure, although the studies have been criticized because of the limited number of study participants. Two epidemiological studies published this year have looked for but not found a relationship between consumption of baked or fried potatoes and incidence of various cancers.

Any possible risks associated with acrylamide in food would arise from long-term exposure. Because acrylamide is produced through natural cooking processes, it is likely that humans have been exposed to it for a significant amount of time (FSA, 2002). Recent research at RTI International has characterized the process by which acrylamide consumed orally is metabolized in the human body. Results will contribute toward methods of measuring human exposure to acrylamide.

ACRYLFAST™

Is an enzyme-based formula designed and engineered to reduce and block the formation of acrylamide in foods, used as processing aid and as recommended beneficial option as treatment for manufacturers and the industry in the fight to prevent excessive exposure to acrylamide by population and general consumers, but specially sensible population. It´s used on Asparaginase enzyme with a proprietary formula and combination of amino-acids, natural extracted high quality ingredients and certain additives used as carriers.

EASY TO USE	COST-EFFECTIVE	SAFE & HEALTHY
As a «Pour-On» product, ACRYLFAST™ is presented in solid powder and liquid formulation for convenience and easy use.	Stable @pH 5.0 to 9.0 +3.500 ASNU (Units). Our special formula cut by half the cost of regular enzyme preparations to same purpose. Reduction up to 90% of Acrylamide on single dosage application.	As Product disappear after baking and/or cooking of foodstuffs, no enzyme activity is registered within the final product, only an inactivated protein form is detectable within. So no concerns on health and safety in the short, mid and/or long term.

ACRYLFAST™ MAIN BENEFITS

- Product has proven in being useful to reduce acrylamide in a variety of foodstuffs and processes including different applications systems and methods. As per there are 2 differentiated presentations (Powder & Liquid), it´s adaptable and convenient for all kind of industries and products.
- Reducing Acrylamide without altering product attributes is also a benefit of use of ACRYLFAST™
- No health and safety concerns from the use of product as no enzyme activity is registered and/or detected after use. Since enzyme losses all activity over 95ºC, the remaining product is an inactivated protein form that has no impact within the organism.
- ACRYLFAST™ is produced mainly from an organism with a long history of safety within the production of enzyme and Food-Grade enzymes preparations from its strains with no records of production of toxic metabolites.
- ACRYLFAST™ complies with International Standards of highest quality food grade products and preparations. (under ISO and GMP).
- Reduction of Acrylamide formation proven up to 90% of the total values detected.

FICHA TECNICA ACRYLFAST™ (SOLIDO y LIQUIDO)

1. **Nombre de la Firma** ND Pharma & Biotech
2. **Nombre del producto** **ACRYLFAST™**
3. **Marca Comercial** **ACRYLFAST**
4. **Fábrica productora y dirección, provincia o país:**
   ND Pharma & Biotech, BU13, Cornellá, Spain.
   ND Pharma & Biotech, BU19, Tui, Spain.
   ND Pharma & Biotech, BU27, Bruselas, Belgium.
5. **Descripción** Formulado tecnológico de base enzimática para el control de acrilamidas en productos horneados.
6. **Composición** L- Asparaginasa aminohidrolasa, Glicina, Acido cítrico, Sales sódicas y potásicas como agentes de estandarización/carriers.
7. **Características Físico-Químico** Polvo sólido blanquecino. Presentación en líquido para ciertas aplicaciones industriales.
8. **Información microbiológica:** Contaje total: $<3x10^3$ ufc/g, Mohos y levaduras: <100 ufc/g, E. Coli: Ausencia en 10g, Salmonella: Negativo en 25 g.
9. **Fórmula estructural** n/a
10. **Dosis y/o Forma de uso**
    0.5 – 3% sobre producto final.
11. **Materias primas empleadas o composición**
    Las descritas
12. **Especificaciones de identidad y pureza** USP, EP, FCC y Codex Alimentarius, de los ingredientes.
    Pureza 98´5% a 101´5% por ingrediente en composición.
    Para uso alimentario con arreglo a la legislación vigente

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13. **Breve descripción del proceso tecnológico.**
    Purificación, Ultra-filtrado, Cristalización y Mezcla de los componentes puros en las proporciones indicadas en la reivindicación de la invención.
14. **Tipo de envase utilizado**
    Envases de 5, 10 y 25kg
15. **Etiquetado. Según CODEX STAN 107-1981**
16. **Condiciones de almacenamiento y/o conservación**
    Almacenar fuera del alcance de la luz en envase original y lejos de humedad, preferiblemente en refrigeración después de abierto el envase.
17. **Licencia Sanitaria del comercializador y/o propietario de la marca:**
    40/051679/V

Cost-Effective Solution ACRYLFAST™

ACRYLFAST™ represents and advantage for industry and consumers, as not too many options for reduction of Acrylamide formation are available for the industry at a reasonable cost.
Enzyme extraction and food-grade enzyme-based preparations are made throughout expensive and costly technologies, including the preservation, packaging and maintenance of enzymes that may need constant positive cold and eventually freeze for storage, at risk of loosening of activity that may turn preparations into unviable ones, once application is needed or done.

As far as not all treatments for reducing Acrylamide formation are effective and viable, the option of a natural reduction of such, thorough a simple, permitted, technologically advanced product, is configured as the best solution available to industry and consumers within the market nowadays.

For more information and/or technical assistance:
Write Us to:
info@ndpharmabiotech.com

Ref: ACRYLFAST

ACRYLFAST™ | is a registered trademark of The ND Pharma & Biotech Company Ltd.
Effectivity of this product, as it happens with all enzymes, may depend on a number of variable issues to consider when applied to processes and foods. So prior to make any application we strongly recommend asking for assistance from our technicians and Tech-Center.

ndpharmabiotech@tech-center.com

ND Pharma & Biotech Co.

ND Pharma & Biotech is active worldwide in Pharma, Nutrition, Agriculture, Industrial, Performance Materials and Chemicals. The company creates innovative products and services that help to improve life according with its motto of Making Life Better®. ND Pharma & Biotech products are used in a wide range of end markets and applications from human and animal nutrition, healthcare, life sciences, cosmetics, pharmaceuticals, automotive, transport, coatings, housing, electrics and electronics, crop protection, food preservation, disinfection and hygiene, etc. ND Pharma Food Specialties portfolio focuses on accelerating profitable and innovative growth of this Company Division Portfolio. Market-driven growth, innovation and increased presence in emerging economies are key drivers of our main strategy. We are within the global leaders in the field with a current portfolio of + 200.000 product references and + 800 own proprietary technologies and developments. Headquartered in England, UK, and proudly operating worldwide. More information can be found at www.ndpharmabiotech.com, and subsidiary websites as www.ndpharmabiotech.net and Corporate site www.ndpharmabiotech.org or writing us to info@ndpharmabiotech.com, stating clearly the motive of your communication, information needed, and contact data, both personal and institutional.

ND Pharma & Biotech

ND Pharma & Biotech – We do Science for You.™

For more information on the most effective way to reduce acrylamide in foods, contact us now: info@ndpharmabiotech.com | www.ndpharmabiotech.com

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