



WATER & MOISTURE REDUCTION

# HYGROPLUS™

HYGROPLUS™ is the first commercial formula made from food ingredients 100% Safe & Edible with special activity in water and moisture control and/or reduction within chocolates, cocoa, confectionery, bakery and other applications without loosening of flavour, taste and fragrance experience for a premium quality-longer shelf life in a better taste condition products and elaborated foods that incorporate cocoa, chocolate and/or others as cinnamon or other.

# WE OFFER TO YOU OUR BEST CHEMISTRY

We are a biopharmaceutical and biotechnological company, with a solid scientific medical and biochemical foundation, and strong tradition and experience in the cosmetic and beauty field.

As science is part of our reason to exist, the foundation of every development and the light that shines after each development we made is related to the development of products and services that may help in some ways to make our lives better.

So thru publications like this one you have now in hands, is how we serve as a voice to this light in contact with our esteemed public, clients, friends, collaborators, customers and the general public.

Sometimes, the labor of a company like ND Pharma & Biotech may be relegated to a second stage as we do not sell or produce (barely) finished products to the final consumer.

But our importance is capital, when each person can, without knowing it effectively, are consuming our products within foods or medications they take, or benefiting from the food safety and health impact that some developments we created, are providing to them in different applications, and cosmetics, beauty and personal care products, conforms an important part of our supplies.

This is the way we want to participate within the improvement of our society and wellbeing, just giving to our customers the better of the best.

*The ND Pharma & Biotech Team*

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## We are ND Pharma & Biotech

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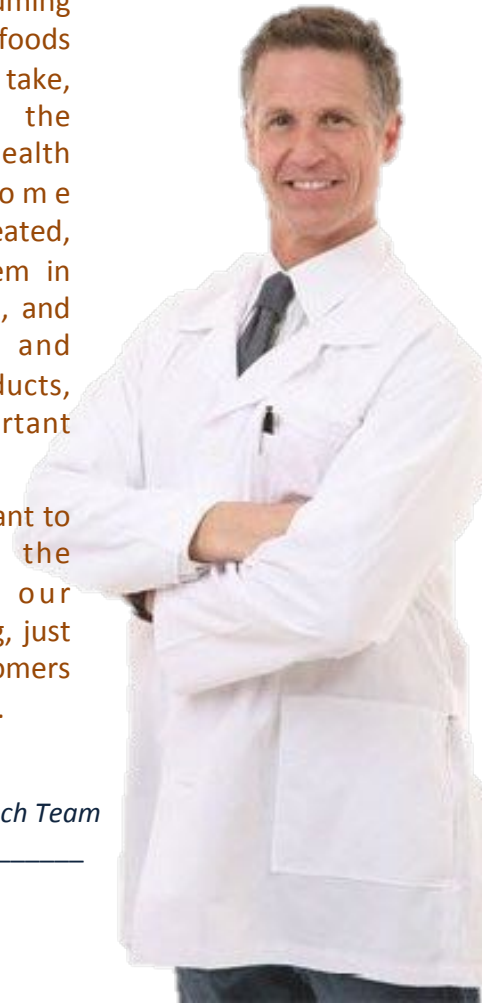
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## **Why ND Pharma & Biotech?**

**Because we know how to do it right.**

**Our Company has the most complete offer of ingredients and compounds for the Industry.**

- Tradition and many years experience in Food Industry R + D
- Scientifically Sounded and Science-Platform integrated offer.
- Top world-class quality of products.
- Complex production basis with access to qualified staff.
- Complex scientific base and growing investments in R+D+i.
- Experience in International Markets.
- Experience in contracting, both as CRO and CMO.
- Flexible and adaptive structure.
- Convenient location of our production centres.
- High experience in logistics and delivery for a better service.

Water activity plays an important role in the safety, quality, processing, shelf life, texture and sensory properties of confections.

Throughout years and in special during this modern and industrialized era, the importance of controlling water in food by drying, freezing, or adding sugar or salt has been recognized for preserving and controlling food quality by different researchers, authors and published works.

Most scientists recognize the importance of water activity in predicting the growth of microorganisms. However, water activity control is also useful in predicting quality and shelf-life with respect to physical properties and chemical reaction rates. Water activity is the driving force for moisture migration between components or layers within a sample.

Water activity also impacts physical properties such as texture, crystallization, and powder flow properties. Water activity influences chemical reactivity by acting as a solvent, reactant, or changing the mobility of the reactants by affecting the viscosity of the system.

Measuring and controlling water activity facilitates the development and production of high quality confectionery products that are safe and shelf stable.



**HYGROPLUS™** is the first commercial formula made from food ingredients, worldwide authorized engineered and designed for water activity/moisture control within foods and foodstuffs, especially those made from and/or by cocoa, chocolate, and many other raw ingredients, as well as those that may incorporate flavoring ingredients as cinnamon, vanilla, coffee, etc. or in combination with nuts, dry fruits, almonds and/or many others where manufacturers don't want to lose taste experience, consumer's pleasure and quality perception or premium products by action/interaction of water/moisture that may corrupt the characteristics of mixtures, conformation masses or final product.

Water activity is the key to understanding water's impact on confections. Water impacts on microbial, physical, chemical stability, shelf-life and general quality of confectioned products. Selection of both major and minor ingredients forming the final elaborate also impacts in reciprocity to final water activity and moisture control.

Modification of a formulation to improve on aspect of quality, say that bacteriological, chemical or physical may well have either a positive or negative effect on another property of the product, so water activity/moisture control plays an extremely important role in the behavior of materials, ingredients and final products during and following manufacture.

Most of confectionery products and those depicted here are made of natural ingredients with a number of refining processes, the addition of sugars, fats, flavoring agents and water. These components are combined with some interfering texturing agents, syrups, and many others.

Water is being supersaturated with solutes, usually sugars (sucrose) and the raw ingredient that forms the base, (cocoa, chocolate, vegetable fats, oils, etc.) The variations between different product ranges and classifications rely mainly in the amount of ingredients in relation with water and/or moisture content. A wide range of water activities may also be seen within this different kinds of products.

Water activity is a measure of the energy status of the water in a system. Is defined as the ratio of the partial pressure of water above a product to that of pure water at the same temperature. Is also a thermodynamic concept related to free energy. There are some elements that controls water activity within a foodstuff, colligative, capillary and matric interactions. Thru a complex mechanism we know that water activity and moisture content have an effect on each other.



HYGROPLUS™ as a natural system of water activity/moisture control presents a number of advantages when added to foodstuffs, impacting in different areas:

- Provides higher microbial safety as reduce water activity.
- Improves textural properties of food products even in low moisture content.
- Reduces moisture migration in multi-domain foods with different regions of water activity.
- Preserves stability, flow and caking and clumping of powders during storage.
- Maintains proper product structure, texture, flow-ability, density and rehydration properties.
- Prevent moisture exchange when products are filled and/or combined with crispy materials such as nougat, fondant, nuts, creams, etc., as it maintains identical levels of water activity and moisture content.
- Critical for stability as no migration occurs when water activities are similar.
- Reduces hygroscopic behavior of amorphous sugars.
- Temperature resistant (melting point over 200°C).
- Improves chemical stability of ingredients and final products not affecting technology of such.
- Less chemical reactivity in different ways. (Prevents changes in the mobility of the reactants affecting different parameters from viscosity to time-dry capacity of powders).
- Prevents undesirable texture changes due to moisture migration in multicomponent foods.
- Prevents loosening of crispness and environmental moisture uptake and/or redistribution.
- Influence on non-enzymatic browning (Maillard), lipid oxidation, degradation of vitamins, enzymatic reactions, protein denaturation, starch gelatinization and starch retrogradation.
- Less water activity impacts on complex reactions between sugar-reductors and free amine groups from proteins and/or amino-acids.
- Improves flavor and tasteful experiences.

HYGROPLUS™ is essential in production of high quality, safe and shelf-stable products with better nutritional value and healthful benefits.

PRODUCT NAME.....**HYGROPLUS™**  
ORIGIN.....Spain  
PRODUCER NAME.....ND Pharma &Biotech – INTABIOTECH SLU (Commercial)  
ADDRESS.....Botiguers, 3, 1<sup>st</sup> floor, 46980, Paterna, Valencia, Spain  
INGREDIENTS.....Amino Acids, Sodium and Calcium Hydrogen Carbonate, Anti-caking (SiO<sub>3</sub>) in strict accordance with Regulation EC 1925/2006 and Regulation EC 1170/2009.  
PACKAGING.....25 Kg Paper Bags, double layer inner protection foodstuffs poly or alternatively Poly Bag.

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APPEARANCE.....White Crystals  
ODOUR.....none  
FLAVOR.....A hint of sweet.

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Fits for human consumption, animal consumption, supplementation, enrichment and fortification (under dosage) and for all those technological applications where a moisture reduction and protection against certain microorganism activities are desired/pretended. Non-Inhibitory. Product acts throughout moisture and humidity level reduction.

No radiations or danger components, No GMO's, Kosher/Halal approved.

As indicated on the ingredients part ;the product is a composition of amino acids (nutrient ingredients) and mineral salts powder, and therefore should be diluted, dispersed, dissolved and or added to foodstuffs under established parameters prior to human consumption and/ or during the manufacturing processes in accordance with Regulation CE 1925/2006 and eventually under Regulation CE 1924/2006. Clean Label under Reg. CE 1169/2011.

FIELD OF USAGE: For foodstuffs use in any type of raw materials for foodstuffs and/or elaborated alimentary materials during processes to strengthen the nature of goods against microbiological effects. Can be used as nutritional enhancer (on dosage), shelf-life extension and consumer protection and safety as providing natural protection against spoilage produced by moulds, yeasts, fungus and some bacteria.

\*\*\*Products are produced under regulations 2008/84/CE, 2000/63/CE F.C.C. 6, RD 1466/2009, Reg.EC 1925/2006, Reg. CE 1924/2006 and Reg. EC 1170/2009 as nutritional claims and F.C.C. FDA CLASSIFICATION AS G.R.A.S. GENERALLY RECOGNIZED AS SAFE).

CLEAN LABEL under Reg. CE 1169/2011 in technological applications and where 2% w/w dosage is not surpassed.



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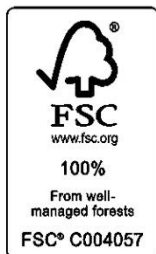
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ND Pharma & Biotech is a biopharmaceutical company that discovers, develops and commercializes innovative products and therapeutics in areas of unmet medical, food, nutritional, agro, industrial and many other needs. The company mission is to advance the care of people suffering from certain diseases, worldwide and to make life better promoting green chemistry issues and removing certain chemical toxics from our daily lives. Company also acts as a chemical supplier and molecular provider including certain rare molecules and hard-to find compounds, APIs Intermediates, Reactives, etc. Headquartered in Surrey, England, UK, ND Pharma & Biotech Company has operations worldwide thru a network of commercial and industrial partners, both companies and/or corporations.

PreserFood, Acarisin, Moldstop, Mycostop, Glalce, Lactolife, Acqualife, SteriFood, FruitFresh, Kangen, Alkiow, Noopeptil, Nooglutil, Inofish, Zoeltar, Bacterskin, Bacterskin 5000, Pinolipol, Veri-K and Veri-K Series, X-Fresh, Acnifol, Glicospart, Mitoprotect, Citrusol, Ihusol, Stevisol, Sucrasol, Acek, 250, PureATP, Aminoprot 100, Asparsol, EcoEit, Anisakill, Calcior, Ferristat, Chikrsafe, Cocqwa, Maltolan DFM, Monki, Peppersol, Reduxait, Vegafresh, Sugar 50, Sugar 20, Florafresh, FishFresh, Zelitem, Tancream, Psoriacrem, Ovofresh, Xantamar, Mohostop, PS454 Nitroboost, PS452 Glicobooost, M.A.R.S. (Micro Alcohol Reaction System) and many others, are registered trademarks of ND Pharma & Biotech Co. Ltd. And/or some of its related companies. Marks may not be available everywhere.

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