



NUTRITIONAL SUPPLEMENTS

**Engineer the process.
Deliver the formulation.**

From ingredient to finished dose.



**The right ingredient. The right amount.
In every serving.**

Protein powders • Enriched blends • Collagen peptides
Functional drinks • Precision premixes • Supplement formats

Receive • Dose • Mill • Mix • Transform • Inspect • Pack

GULFOOD | PROCESS TECHNOLOGY COLLECTION

procxinc.com

01

PROC-X

MANUFACTURING GROUP

One group.

Connected process expertise.

Build the line around the product.



Bulk receiving, storage, conveying, weighing, ingredient dosing and recipe handling.



Milling, deagglomeration and particle-size conditioning selected for the ingredient.



Dry blending, premixing, liquid addition and configured thermal or vacuum processing.



Powder induction, liquid dispersion, emulsification, homogenization and deaeration.



Spray- and belt-drying pathways for suitable ingredients and formulations.



Extrusion pathways for suitable nutritional ingredients, crisps and structured products.



Powder and liquid filling, packaging and associated handling.



Metal detection, checkweighing and reject-system integration.



PROC-X ENGINEERING

Connect equipment, utilities, controls, hygiene and acceptance criteria around the finished product. Specialist process and dosage-form modules are defined within each project.

Quality starts before the mixer.

Receive correctly. Store intelligently. Transfer carefully.

01

VERIFY & RELEASE

Identify incoming materials and retain lot traceability. Keep quarantined, released and rejected stock clearly separated.



02

RECEIVE TO SUIT THE MATERIAL

Select bag-dump, bulk-bag, drum, tote or silo arrangements around ingredient format and production demand.



03

CONTAIN & PROTECT

Control dust at opening and transfer points. Apply screening and foreign-material controls where appropriate.



04

STORE FOR STABILITY

Manage moisture, temperature and oxygen exposure according to ingredient sensitivity. Design hoppers for reliable discharge.



05

TRANSFER WITH CARE

Select conveying for the powder. Fragile agglomerates, cohesive proteins and dense minerals may require different conditions.



THE PROC-X ANSWER

AIS connects receiving to production with handling equipment selected around flow behavior, hygiene, containment and cleaning access.



Every addition. Under control.

Automatic dosing that matches the recipe.
Major ingredients. Minor ingredients. Critical additions.

01

MAJOR INGREDIENTS

Bulk weighing and controlled transfer establish the formulation base. Size the weighing system around batch demand and ingredient flow.



02

MINOR INGREDIENTS

Dedicated feeders meter flavors, fibers, sweeteners and salts. Select feed mechanisms around cohesion, density and target addition weight.



03

MICRO-INGREDIENTS

Use appropriately sized weighing systems, verified manual additions or automated dispensing for low-dose components.



04

LIQUID ADDITIONS

Meter oils, flavors, binders and concentrates using suitable pumps, weighing or flow measurement.



THE PROC-X ANSWER

AIS dosing and recipe controls can be configured for ingredient verification, coarse/fine feeding, tolerance checks, addition sequencing and batch records.

Specify accuracy at the actual addition weight.
Not simply at the scale's maximum capacity.

Verify performance with the actual ingredient, including refill and production conditions.

The right ingredient. The right amount. In every serving.

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04

Small additions. Large consequences.

Engineer the premix before the final blend.

Different concentrations, densities and particle sizes
require a deliberate blending strategy.

01

CONFIRM THE INGREDIENT

Verify identity, potency basis and
release status before weighing.

02

SELECT THE CARRIER

Use a compatible carrier where
the formulation permits.

03

BUILD THE PREMIX

Develop a staged dilution or premixing
sequence for the low-dose components.

04

CONTROL THE TRANSFER

Account for product retention,
adhesion and transfer losses.

05

LOAD IN SEQUENCE

Introduce the premix through a
validated loading and mixing sequence.

06

VERIFY THE FINISHED RESULT

Evaluate representative samples
through discharge and packaging.



THE PROC-X ANSWER

AIS controls the additions. QuantumX provides the selected
premixing and final blending technology. Controlled transfer
and filling preserve the result.

**A uniform mixer sample does not prove
a uniform production run.**

Assess distribution in discharged product and finished packs.

Mill for function.

Control particle size.
Preserve ingredient performance.



Define the duty before choosing the mill.

01

DEAGGLOMERATE OR REDUCE?

Break soft lumps when that is the objective. Use true size reduction only where the ingredient and downstream process require it.



02

SET THE PARTICLE TARGET

Define top size and particle-size distribution around mouthfeel, feeding, blending or dispersion.



03

MANAGE THE PROCESS

Consider temperature rise, oxidation, dust generation, wear, contamination and cleaning access.



04

PROTECT THE FINISHED STRUCTURE

Finished instantized agglomerates and coated actives may be damaged by unnecessary downstream milling.



THE PROC-X ANSWER

DP selects the milling approach around feed properties and the required product. Cooling or specialized configurations are evaluated where justified.

Selection inputs: moisture • fat • fiber • hardness • heat sensitivity • target size

Do not mill away the benefit.

Condition the ingredient. Preserve the functionality.

Choose the mixing action.

Different powders. Different movement.

01

RIBBON

Horizontal and vertical configurations for suitable convective blending duties.



Horizontal



Vertical

02

PADDLE

Single-shaft, twin-shaft and vertical configurations selected for circulation, fragility and liquid addition.



Horizontal



Vertical

03

PLOW

Intensive mixing for cohesive materials, with optional choppers and liquid addition.



04

CONICAL SCREW

Gentle circulation for suitable powders and batch requirements.



05

V, DOUBLE-CONE & DRUM

Tumbling for suitable free-flowing blends.



06

HIGH-SHEAR GRANULATOR

Controlled wet massing and granule development when required.



07

VACUUM & THERMAL VARIANTS

Configured drying, temperature control and defined process duties.



SELECT AROUND YOUR PRODUCT

Cohesion • density • fragility • fill range • liquid load • discharge • cleanability
Working fill, process conditions and performance are confirmed through product trials.

Protein powders

**Build the blend.
Preserve its functionality.**

Whey • Casein • Milk • Egg • Soy • Pea • Rice

From released ingredient to finished pack

01

RECEIVE & VERIFY

Confirm ingredient release and lot identity. Select controlled receiving for cohesive, dusty or free-flowing powders.



02

CONDITION WHERE NEEDED

Screen or deagglomerate only when required. Preserve instantized structures and sensitive ingredient functionality.



03

DOSE & PREMIX

Meter the protein base. Prepare flavors and minor ingredients through a defined premixing sequence.



04

BLEND & TRANSFER

Select the mixing action and working fill. Control discharge and transfer to limit segregation and product retention.



05

FILL & INSPECT

Match the filler to powder flow and bulk density. Verify fill quantity, sealing, coding and inspection performance.



THE PROC-X ANSWER



AIS handles and meters. DP conditions where necessary. QuantumX develops the blend. PreciXion and InspeX support the finished pack.

Control: density differences • cohesion • flavor distribution • wetting • mouthfeel • allergen changeover

Formulating purchased protein ingredients differs from producing concentrates or isolates. Extraction, separation and concentration require a separately defined process.

Enriched protein formulas

**More ingredients.
More process control.**

Vitamins • Minerals • Amino acids • Creatine • Fibers

Build the formulation with precision

01

ESTABLISH THE BASIS

Confirm the formulation, ingredient identity and potency basis before calculating additions.

02

SEPARATE THE DOSING DUTIES

Assign major, minor and micro additions to appropriately sized weighing and feeding systems.

03

PREPARE THE PREMIX

Use a validated premixing strategy where low-dose ingredients require staged distribution.

04

CONTROL THE MIXING

Define loading order, working fill and mixing conditions around the actual formulation.

05

PROTECT SENSITIVE COMPONENTS

Handle fragile or coated ingredients carefully and control discharge and transfer.

06

VERIFY FINISHED PACKS

Confirm composition and distribution through the run, using appropriate sampling and analysis.



THE PROC-X ANSWER

Connect **AIS** recipe dosing with QuantumX premixing and blending. Control discharge, transfer and packaging to limit segregation.

Correct composition. Consistent servings.

Acceptable sensory performance. Stability in the selected package.

Milling does not increase protein concentration. Higher-protein products depend on ingredient selection, formulation or a separately defined concentration process.

The right ingredient. The right amount. In every serving.

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Collagen & peptide formulas

**Protect the ingredient specification.
Engineer the finished product.**

Powders • Flavored blends • Stick packs • Shots • RTD

01

POWDER FORMULATIONS

Released collagen peptides / controlled dosing / compatible premix preparation / final blending / protected transfer / moisture-conscious packaging.



02

LIQUID FORMULATIONS

Controlled water addition / peptide dispersion and dissolution / recipe adjustment / air management where needed / validated preservation / filling and inspection.



03

CONTROL THE SPECIFICATION

Confirm ingredient source, identity and peptide specification. Evaluate flavor, moisture, flow and compatibility with the finished formulation.



THE PROC-X ANSWER



AIS, QuantumX, EmulXion, PreciXion and InspeX connect controlled ingredient handling to the finished format.

Formulation is not peptide production.

Producing collagen peptides involves controlled hydrolysis. Mechanical milling and mixing do not establish a specified peptide molecular-weight profile.

Specialty powders & sensitive ingredients

One platform. Different handling strategies.

01 **ELECTROLYTE & HYDRATION POWDERS**
Control mineral distribution, moisture, flavor balance and dissolution behavior.



02 **CREATINE & AMINO-ACID BLENDS**
Control addition accuracy, flow, particle distribution and segregation.



03 **VITAMIN & MINERAL PREMIXES**
Define potency basis, low-dose distribution, containment and carryover control.



04 **BOTANICAL & GREENS BLENDS**
Manage raw-material variability, fiber, milling duty, microbial quality and dust.



05 **FIBER & PREBIOTIC BLENDS**
Evaluate density differences, hydration behavior, cohesion and filling consistency.



06 **PROBIOTIC & ENZYME FORMULAS**
Protect against ingredient-specific sensitivity to heat, moisture, oxygen and processing stress.



THE PROC-X ANSWER



Configure handling, dosing, mixing sequence, environmental controls and packaging around the most sensitive ingredient.

Product appearance is not a potency test.

Use appropriate assays and stability studies to demonstrate the finished specification.

Instantization, granulation & coating

Design how the powder behaves in use.

A correctly blended powder can still pour, scoop, fill or reconstitute poorly. Engineer particle behavior for the application.

01

AGGLOMERATION

Build larger porous structures to improve handling, wetting and dispersion. Evaluate binder addition, drying and final particle size.



02

GRANULATION

Develop granules for filling, compression or downstream processing. Control liquid addition, shear, moisture and size distribution.



03

LECITHINATION & SURFACE TREATMENT

Evaluate suitable surface treatments to improve powder wetting. Match treatment level and application method to the formulation.



04

COATING & ENCAPSULATION

Apply functional or protective layers where justified. Select materials and processing conditions for the ingredient and intended release behavior.



THE PROC-X ANSWER

Coordinate mixing, liquid dosing, granulation, drying, cooling, sizing and transfer. Define specialist fluid-bed or coating modules within the project scope.

QuantumX

QuantumX mixing and granulation • AIS ingredient dosing • ThermoFlow drying integration

AIS

Better wetting is not the same as solubility.

Agglomeration can improve reconstitution behavior; it does not automatically make an insoluble ingredient soluble.

Liquid feed to nutritional powder

Build the feed correctly. Dry it for the application.

01

PREPARE A CONSISTENT FEED

Dose ingredients, hydrate or dissolve, then disperse or emulsify as required. Control solids, viscosity, particle size and feed consistency.



02

SELECT THE DRYING ROUTE

Use product trials to select spray, belt or vacuum drying. Define feed preparation, appropriate upstream treatment, drying conditions and cooling around the formulation.



03

FINISH FOR THE FINAL FORMAT

Cool, size and handle the powder with controlled exposure. Verify moisture, water activity, bulk density, surface fat, particle structure and reconstitution before packaging.



THE PROC-X ANSWER



ThermoFlow drying

AIS ingredient dosing • QuantumX feed preparation • EmulXion dispersion • ThermoFlow drying
Connect the process through cooling, finishing, transfer and packaging.

Drying is not automatically a validated kill step.

Define microbial controls and validate the selected treatment for the actual product and process.

RTD nutritional drinks & liquid shots

Develop the formulation through the full heat-and-package cycle.

Protein shakes • Collagen drinks • Liquid shots • Electrolyte drinks



01 HYDRATE & BUILD THE BLEND

Dose water and ingredients. Wet and hydrate proteins or dissolve soluble components before final blending. Control addition order, temperature, mixing time and foam.



02 CONTROL DISPERSION & STABILITY

Disperse, emulsify or homogenize as required. Evaluate pH, protein-mineral interactions, solids, viscosity, sedimentation and creaming. Manage entrained air where needed.



03 VALIDATE HEAT TREATMENT & FILLING

Select a validated preservation process and compatible hygienic or aseptic filling system. Test product quality after the selected heat treatment and through the intended shelf life.



THE PROC-X ANSWER



QuantumX and EmulXion support liquid preparation, mixing and dispersion.

Proc-X coordinates the thermal process and packaging interfaces around the formulation.

Hydration, homogenization and preservation have different jobs.

Homogenization does not replace hydration. Pasteurization alone does not establish ambient shelf stability.

Beyond powders & drinks

Prepare the formulation for its final format.

01

CAPSULES & TABLETS

Prepare blends for uniformity, flow, particle properties and moisture. Confirm compatibility with capsule filling or tablet compression.



02

EFFERVESCENT FORMULAS

Control humidity and exposure throughout dosing, mixing, transfer and packing to prevent premature reaction.



03

GUMMIES & GELS

Coordinate hydration or cooking, solids, temperature and viscosity. Define active addition, depositing and setting around ingredient sensitivity.



04

SOFTGEL & OIL-BASED FORMULAS

Prepare the fill formulation through controlled mixing, dispersion or emulsification. Manage entrained air and confirm downstream compatibility.



05

BARS, BITES & CRISPS

Match mixing, extrusion, forming and drying to texture, ingredient sensitivity and the final product structure.



THE PROC-X ANSWER

Connect formulation preparation to the downstream format, with ingredient handling, mixing, transfer and packaging defined as one project.

Specialist capsule, tablet, softgel, depositing and forming modules are confirmed within the project scope.



The final format starts with the right preparation.

Agree product specifications, process interfaces and acceptance criteria before selecting the line.

Hygiene, containment & changeover

Design for the next batch as carefully as the current one.

01 DESIGN FOR ACCESS & CLEANABILITY

Specify accessible product-contact surfaces, inspectable seals and practical disassembly. Select dry or wet cleaning for the product and equipment.



02 CONTROL CHARGING & TRANSFER

Use enclosed transfer and appropriate dust capture at charging and discharge points. Define containment needs and assess combustible-dust hazards.



03 VERIFY THE CHANGEOVER

Validate cleaning for carryover and allergens. After wet cleaning, verify equipment is adequately dry before powder production resumes.



04 PROTECT BATCH STATUS

Keep released, quarantined and rejected materials segregated. Define line clearance, change parts, cleaning records and restart checks.



THE PROC-X ANSWER

Define hygiene zoning, transfer methods, cleaning access, utilities and verification requirements early in the project.



Microbial reduction must fit the ingredient.

Not every powder is suitable for steam treatment. Validate any reduction process while protecting potency and functionality.

Pack the formulation you created

Preserve composition, accuracy and stability through the final pack.

01

MATCH THE PRODUCT & FORMAT

Powders: tubs, jars, pouches, sachets, stick packs and bulk bags. Liquids: bottles, shots and compatible sachets. Solid formats: suitable counting, handling and packaging.



02

CONTROL FILLING PERFORMANCE

Select the filling system around flow, bulk density, dust, foam or viscosity. Define target fill, format range, changeover requirements and product handling.



03

INSPECT THE FINISHED PACK

Specify inspection for the product and package. Verify fill weight, seal integrity, codes, labels, reject handling and traceability using appropriate checks.



04

PROTECT THROUGH SHELF LIFE

Choose moisture and oxygen barriers, desiccants or nitrogen flushing where justified by stability studies. Confirm closure and seal performance for the intended conditions.



THE PROC-X ANSWER

PreciXion configures filling and packaging around product behavior. InspeX supports product- and package-specific inspection.



Two checks. Two different purposes.

Checkweighing verifies pack weight. It does not establish ingredient potency or blend uniformity.

Four example production lines

Start with the product. Connect the operations.

01

FORTIFIED PROTEIN POWDER

ALS receiving and weighing; DP conditioning where required; QuantumX micro-premixing and final blending; controlled transfer; PreciXion filling; InspeX inspection.



02

COLLAGEN STICK PACKS

Released collagen peptides; controlled minor-ingredient additions; final blending; transfer designed to limit segregation; stick-pack filling; weight, seal and code checks.



03

INSTANT NUTRITION POWDER

Ingredient preparation; controlled liquid addition and agglomeration; drying and cooling; sizing; sensitive post-additions where validated; protective packaging.



04

RTD PROTEIN DRINKS

Ingredient dosing; hydration and blending; dispersion or homogenization; validated thermal processing; hygienic or aseptic filling as required; finished-pack checks.



THE PROC-X ANSWER.

Define each line around the recipe, output, pack format, cleaning method, available utilities and agreed acceptance criteria.

Select and integrate each operation to protect the finished product specification.

PreciXion

InspeX

Example configurations. Product-specific engineering.

Confirm equipment selection, specialist modules and process conditions through application review and trials.

Define success. Then prove it.

Connect equipment acceptance to product performance.

01

TRIAL THE ACTUAL FORMULATION

Use representative ingredients and recipes. Evaluate mixing, transfer, filling, reconstitution and stability against agreed product specifications.



02

VERIFY DOSING & BLEND PERFORMANCE

Test dosing at actual ingredient weights and refill conditions. Sample during discharge and packaging to evaluate uniformity and segregation.



03

AGREE FAT & SAT ACCEPTANCE

Define factory and site acceptance tests before manufacture. Assess output, yield, product losses, changeover, utilities, maintenance access and operating flexibility.



04

DELIVER THE ENGINEERING PACKAGE

Define the design basis, equipment specifications, general arrangement, P&ID, utilities, controls, cleaning approach, test protocols, training and documentation.



THE PROC-X ANSWER

Set measurable acceptance criteria. Test the process against them. Document the results and the operating requirements.



Equipment supports your quality system.

Product identity, purity, strength, composition and contamination controls require defined specifications, testing and records. Machinery alone does not establish compliance.



Your formulation. Our process expertise. From the first ingredient to the finished serving.

Bring us your formulation, raw materials, output target and packaging requirements. Together, we define the process, select the equipment and agree how success will be measured.



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procxinc.com | 20