

PROFESSIONAL TECHNICAL PRE-FEASIBILITY

PRODUCTIVE BAKERY PROJECT

Artisanal, Semi-Industrial and Industrial Processes

COLOMBIA · CHILE · ARGENTINA

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Technical pre-feasibility document

TECHNICAL NOTE AND SCOPE

This project converts preliminary research into a production system comprising 36 individual technical sheets—12 for each country. The portfolio prioritizes representative and commercially relevant varieties; it is not an exhaustive inventory of every regional name.

Formulas expressed in baker's percentages are trial bases. Three Colombian formulations draw directly on the practical SENA guide; the remaining pilot formulations were developed from standard baking practices and must be adjusted to the selected flour, climate, oven, and target sensory profile.

Unit cost is a semi-industrial manufacturing estimate: raw materials plus packaging and a provisional burden for labor, energy, cleaning, losses, and overhead. It excludes taxes, commercial freight, sales commissions, profit, and financial depreciation of equipment.

The stated shelf life is conservative and indicative. Confirm it through water-activity testing, microbiology, package-integrity checks, and stability studies under actual distribution conditions.

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1. EXECUTIVE SUMMARY AND STARTUP STRATEGY

The project proposes a modular platform that can begin as an organized artisanal bakery, progress to a semi-industrial plant, and finally automate the highest-volume product families. Launching all 36 varieties at once is not recommended; a phased introduction is proposed.

Stage	Portfolio	Objective	Gate criterion
Pilot	12 flagship products	Validate formulas, market, costs, and production rhythm	Loss <5%; complaints <1%; target gross margin achieved
Expansion	24 products	Add families sharing equipment and raw materials	Adequate turnover and available proofer/oven capacity
Full portfolio	36 products	Segment retail, food service, and longer-shelf-life products	Traceability, stable quality, and consolidated logistics

Suggested pilot products

Colombia: French-style bread, pan aliñado, semi-whole-wheat mogolla, and pandebono.

Chile: marraqueta, hallulla, pan amasado, and sandwich loaf.

Argentina: French loaf/flauta, country bread, laminated lard bread, and soft sandwich loaf.

Value proposition

- Three-country portfolio combining local identity with standardized processes.
- Daily fresh production together with longer-shelf-life lines.
- Batch sheets, editable costing, quality controls, and defined retail presentations.
- Scalability by family through mold or forming changes.

2. PRODUCTION-SYSTEM DESIGN AND OPERATING SCALES

Scale	Indicative capacity	Staff/shift	Technology	Recommended use
Organized artisanal	50-150 kg/day	3-6	Mixer, manual divider, oven, simple proofers	Market validation and local sales
Semi-industrial	300-800 kg/day	8-16	Semi-automatic dividing/forming, proofers, rotary ovens	Recommended starting model
Industrial	2-10 t/day	20-60	Dosing, continuous lines, tunnels, cooling, packaging	Regional/national distribution

Flow must be one-way and separate raw-material receiving, processing, baking, cooling, and finished product. Minimum zones include receiving/quarantine, dry and refrigerated storage, weighing, mixing/forming, controlled proofing, baking, protected cooling, slicing/packaging, finished-product dispatch, washing, waste, changing rooms, and sanitary services.

3. COST MODEL AND PRICE ASSUMPTIONS

Batch formula: total cost = raw materials + packaging + processing burden. The provisional burden includes direct labor, energy, sanitation, losses, and allocated overhead. Unit costs must be updated with wholesale prices, payroll, energy, rent, taxes, depreciation, and logistics for the selected city.

Country	Currency	Processing burden	Wheat flour/kg	Comment
Colombia	COP	45% of ingredient cost	COP \$5,170	Replace retail references with local industrial quotations.
Chile	CLP	40% of ingredient cost	CLP \$1,050	Use industrial quotations for investment decisions.
Argentina	ARS	50% of ingredient cost	ARS \$816	Update for inflation and supplier.

REFERENCE INGREDIENT ASSUMPTIONS

Ingredient	Colombia	Chile	Argentina
Wheat flour	COP \$5,170	CLP \$1,050	ARS \$816
Sugar	COP \$5,500	CLP \$1,190	ARS \$1,300
Salt	COP \$2,200	CLP \$540	ARS \$242
Fresh yeast	COP \$25,000	CLP \$9,000	ARS \$6,000
Butter	COP \$45,000	CLP \$9,960	ARS \$11,880
Margarine/shortening	COP \$18,000	CLP \$6,360	ARS \$6,360
Liquid milk	COP \$6,500	CLP \$1,090	ARS \$2,620
Egg	COP \$15,000	CLP \$4,500	ARS \$5,000
Fresh cheese/curd	COP \$33,700	CLP \$9,690	ARS \$11,800
Cassava starch	COP \$19,000	CLP \$4,500	ARS \$3,099

4. TECHNOLOGY-FAMILY PROCESS FLOWS

Family	Standard flow
Lean fermented	Weigh → mix/knead → bulk ferment → divide/form → final proof → steam bake → cool/pack
Enriched	Weigh → mix → knead → rest → divide/form → proof → glaze/bake → cool/pack
Whole grain	Weigh/prehydrate → knead → ferment → divide/form → final proof → bake → cool/pack
Cheese and starch	Weigh → prepare cheese → mix → divide/round → bake → cool → pack
Laminated/fat-rich	Weigh/mix → rest → sheet → fold → cut/form → proof if applicable → bake → cool
Flat/quick	Weigh → mix → short rest → sheet/form → griddle/oven bake → cool → pack
Pan loaf	Weigh → knead → ferment → divide/mold → pan proof → bake → depan/cool → slice/pack
Sweet/festive	Prepare → knead rich dough → add fruit → rest/form → proof/mature → bake → cool → wrap
Cassava flatbread	Receive/wash → peel/grate → press/detoxify → sieve → spread → cook/dry → cool/pack

COLOMBIA — 12 TECHNICAL SHEETS

The following sheets cover the selected Colombia portfolio. Costs are stated in COP and referenced to July 2026.

Colombia · Technical Sheet 01

French-style bread

Technology family: Lean fermented

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	16.60 kg	13.61 kg	37 x 0.36 kg	COP \$2.594

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	COP \$51.700
Water	60%	6.00 kg	COP \$60
Fresh yeast	2%	0.20 kg	COP \$5.000
Salt	2%	0.20 kg	COP \$440
Sugar	1%	0.10 kg	COP \$550
Margarine/shortening	1%	0.10 kg	COP \$1.800
TOTAL INGREDIENTS		16.60 kg	COP \$59.550

French-style bread · Process and commercial control

PROCESS FLOW

Weigh → Mix and knead → Proof → Divide and shape → Final proof → Steam bake → Cool and pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	8-12 min; final dough 24-27°C
Fermentation/rest	Bulk 45-60 min; final 35-50 min at 30-34°C
Baking	220-235°C, 15-20 min, with initial steam
Cooling	45-60 min until <35°C
Applied baking loss	18%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, divider, rounder, moulder, proofing chamber, steam-injection oven, cooling racks	• Weight por pieza $\pm 3\%$ • volume • crust crisp • crumb without underbaked areas • T° internal $>94^{\circ}\text{C}$

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	COP \$59.550
Batch packaging	COP \$9.620
Provisional processing burden	COP \$26.798
Total batch cost	COP \$95.968
Cost per retail unit	COP \$2.594
Commercial presentation	Microperforated bag, 6 units/360 g
Indicative shelf life	1 day ideal; maximum 2 days
Technical note	High-turnover product; sell fresh in staggered runs.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Colombia · Technical Sheet 02

Pan aliñado (Colombian enriched bread)

Technology family: Enriched

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	18.90 kg	16.63 kg	55 x 0.30 kg	COP \$6.057

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	COP \$51.700
Sugar	14%	1.40 kg	COP \$7.700
Salt	2%	0.20 kg	COP \$440
Fresh yeast	4%	0.40 kg	COP \$10.000
Egg	4%	0.40 kg	COP \$6.000
Water	33%	3.30 kg	COP \$33
Milk powder	2%	0.20 kg	COP \$9.000
Butter	30%	3.00 kg	COP \$135.000
TOTAL INGREDIENTS		18.90 kg	COP \$219.873

Pan aliñado (Colombian enriched bread) · Process and commercial control

PROCESS FLOW

Weigh → Mix → Knead → Rest → Divide and shape → Proof → Glaze and bake → Cool/pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	10-15 min
Fermentation/rest	Approx. 60 min at 35°C; final 30-40 min
Baking	165°C, 20 min
Cooling	45 min
Applied baking loss	12%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, worktable, divider, rounder, proofing chamber, oven	• dough soft/elastic • volume doubling • uniform browning • Weight $\pm 3\%$

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	COP \$219.873
Batch packaging	COP \$14.300
Provisional processing burden	COP \$98.943
Total batch cost	COP \$333.116
Cost per retail unit	COP \$6.057
Commercial presentation	Sealed bag, 6 units/300 g
Indicative shelf life	2-3 days
Technical note	Rich formula; control temperature to prevent free fat.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Colombia · Technical Sheet 03

Pan blandito (Colombian soft bread)

Technology family: Enriched

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	19.58 kg	17.23 kg	47 x 0.36 kg	COP \$3.564

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	COP \$51.700
Water	45%	4.50 kg	COP \$45
Liquid milk	15%	1.50 kg	COP \$9.750
Sugar	12%	1.20 kg	COP \$6.600
Margarine/shortening	12%	1.20 kg	COP \$21.600
Egg	8%	0.80 kg	COP \$12.000
Fresh yeast	2%	0.20 kg	COP \$5.000
Salt	1.8%	0.18 kg	COP \$396
TOTAL INGREDIENTS		19.58 kg	COP \$107.091

Pan blandito (Colombian soft bread) · Process and commercial control

PROCESS FLOW

Weigh → Mix → Knead → Rest → Divide and shape → Proof → Glaze and bake → Cool/pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	10-14 min
Fermentation/rest	Bulk 45 min; final 45-60 min at 32°C
Baking	175-185°C, 15-18 min
Cooling	45 min
Applied baking loss	12%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Spiral mixer, divider, rounder, proofing chamber, oven	• Suavidad • moisture uniforme • color browning • no collapse • Weight ±3%

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	COP \$107.091
Batch packaging	COP \$12.220
Provisional processing burden	COP \$48.191
Total batch cost	COP \$167.502
Cost per retail unit	COP \$3.564
Commercial presentation	Polypropylene bag, 6 units/360 g
Indicative shelf life	2-4 days
Technical note	May be sold plain or with at light glaze.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Colombia · Technical Sheet 04

Semi-whole-wheat mogolla

Technology family: Whole grain

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	19.79 kg	17.42 kg	58 x 0.30 kg	COP \$3.045

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	COP \$51.700
Whole-wheat flour	10%	1.00 kg	COP \$6.500
Sugar	12%	1.20 kg	COP \$6.600
Salt	2%	0.20 kg	COP \$440
Margarine/shortening	15%	1.50 kg	COP \$27.000
Fresh yeast	2%	0.20 kg	COP \$5.000
Water	47.5%	4.75 kg	COP \$48
Egg	9.4%	0.94 kg	COP \$14.100
TOTAL INGREDIENTS		19.79 kg	COP \$111.388

Semi-whole-wheat mogolla · Process and commercial control

PROCESS FLOW

Weigh and prehydrate → Knead → Proof → Divide/shape → Final proof → Bake → Cool/pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	10-15 min
Fermentation/rest	Approx. 60 min at 35°C; final 30-45 min
Baking	180°C, 20 min
Cooling	45 min
Applied baking loss	12%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, divider, rounder, proofing chamber, oven	• Distribution of bran • hydration • volume • browning • crumb tender

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	COP \$111.388
Batch packaging	COP \$15.080
Provisional processing burden	COP \$50.124
Total batch cost	COP \$176.592
Cost per retail unit	COP \$3.045
Commercial presentation	Sealed bag, 6 units/300 g
Indicative shelf life	3 days
Technical note	Hydrate bran for 15-20 minutes to improve softness.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Colombia · Technical Sheet 05

Milk bread

Technology family: Enriched

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	18.88 kg	16.61 kg	46 x 0.36 kg	COP \$5.191

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	COP \$51.700
Liquid milk	55%	5.50 kg	COP \$35.750
Sugar	12%	1.20 kg	COP \$6.600
Butter	10%	1.00 kg	COP \$45.000
Egg	8%	0.80 kg	COP \$12.000
Fresh yeast	2%	0.20 kg	COP \$5.000
Salt	1.8%	0.18 kg	COP \$396
TOTAL INGREDIENTS		18.88 kg	COP \$156.446

Milk bread · Process and commercial control

PROCESS FLOW

Weigh → Mix → Knead → Rest → Divide and shape → Proof → Glaze and bake → Cool/pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	10-14 min
Fermentation/rest	Bulk 45 min; final 45 min
Baking	175-185°C, 16-20 min
Cooling	50 min
Applied baking loss	12%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, divider, rounder, proofing chamber, oven	• Dairy aroma • elasticidad • crust thin • moisture • Weight

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	COP \$156.446
Batch packaging	COP \$11.960
Provisional processing burden	COP \$70.401
Total batch cost	COP \$238.807
Cost per retail unit	COP \$5.191
Commercial presentation	Sealed bag, 6 units/360 g
Indicative shelf life	3-4 days
Technical note	Suitable for breakfast and school channels; verify nutrition labeling.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Colombia · Technical Sheet 06

Coconut bread

Technology family: Enriched

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	20.65 kg	18.17 kg	43 x 0.42 kg	COP \$5.823

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	COP \$51.700
Water	35%	3.50 kg	COP \$35
Leche of coco	20%	2.00 kg	COP \$30.000
Sugar	18%	1.80 kg	COP \$9.900
Margarine/shortening	10%	1.00 kg	COP \$18.000
Shredded coconut	20%	2.00 kg	COP \$50.000
Fresh yeast	2%	0.20 kg	COP \$5.000
Salt	1.5%	0.15 kg	COP \$330
TOTAL INGREDIENTS		20.65 kg	COP \$164.965

Coconut bread · Process and commercial control

PROCESS FLOW

Weigh → Mix → Knead → Rest → Divide and shape → Proof → Glaze and bake → Cool/pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	10-12 min; coco al final
Fermentation/rest	Bulk 45 min; final 40 min
Baking	175-180°C, 18-22 min
Cooling	60 min
Applied baking loss	12%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, inclusion doser, divider, proofing chamber, oven	• Distribution of coco • aroma • volume • moisture • absence of rancidity

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	COP \$164.965
Batch packaging	COP \$11.180
Provisional processing burden	COP \$74.234
Total batch cost	COP \$250.379
Cost per retail unit	COP \$5.823
Commercial presentation	Sealed bag, 6 units/420 g
Indicative shelf life	3 days
Technical note	Use stable coconut and control water activity.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Colombia · Technical Sheet 07

Corn bread

Technology family: Whole grain

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	17.20 kg	14.79 kg	35 x 0.42 kg	COP \$2.946

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	70%	7.00 kg	COP \$36.190
Corn flour	30%	3.00 kg	COP \$11.400
Water	58%	5.80 kg	COP \$58
Sugar	5%	0.50 kg	COP \$2.750
Margarine/shortening	5%	0.50 kg	COP \$9.000
Fresh yeast	2%	0.20 kg	COP \$5.000
Salt	2%	0.20 kg	COP \$440
TOTAL INGREDIENTS		17.20 kg	COP \$64.838

Corn bread · Process and commercial control

PROCESS FLOW

Weigh and prehydrate → Knead → Proof → Divide/shape → Final proof → Bake → Cool/package

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	8-12 min
Fermentation/rest	Bulk 45-60 min; final 40-50 min
Baking	190-200°C, 20-25 min
Cooling	60 min
Applied baking loss	14%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, divider, rounder, proofing chamber, oven	• Uniformity of Corn flour • volume • texture not crumbly • Baking

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	COP \$64.838
Batch packaging	COP \$9.100
Provisional processing burden	COP \$29.177
Total batch cost	COP \$103.115
Cost per retail unit	COP \$2.946
Commercial presentation	Sealed bag, 6 units/420 g
Indicative shelf life	2-3 days
Technical note	Adjust water according to corn-flour particle size.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Colombia · Technical Sheet 08

Pandebono cheese bread

Technology family: Cheese and starch

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	24.40 kg	22.45 kg	74 x 0.30 kg	COP \$10.294

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Cassava starch	100%	10.00 kg	COP \$190.000
Corn flour	20%	2.00 kg	COP \$7.600
Fresh cheese/cuajada	80%	8.00 kg	COP \$269.600
Egg	20%	2.00 kg	COP \$30.000
Liquid milk	20%	2.00 kg	COP \$13.000
Sugar	3%	0.30 kg	COP \$1.650
Salt	1%	0.10 kg	COP \$220
TOTAL INGREDIENTS		24.40 kg	COP \$512.070

Pandebono cheese bread · Process and commercial control

PROCESS FLOW

Weigh → Grate/smooth cheese → Mix → Divide and round → Bake → Cool → Pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	5-8 min, low speed
Fermentation/rest	without Proofing; rest 10 min
Baking	200-220°C, 15-20 min
Cooling	30 min
Applied baking loss	8%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Grater, paddle mixer, divider/rounder, oven	• Fresh cheese • uniform dough • expansion • baked center • absence of excessive cracking

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	COP \$512.070
Batch packaging	COP \$19.240
Provisional processing burden	COP \$230.432
Total batch cost	COP \$761.742
Cost per retail unit	COP \$10.294
Commercial presentation	Paper bag or microperforada, 6/300 g
Indicative shelf life	1 day; 2 days refrigerated
Technical note	Sell freshly baked; shaped dough may be frozen.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Colombia · Technical Sheet 09

Cassava cheese bread

Technology family: Cheese and starch

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	21.60 kg	19.87 kg	66 x 0.30 kg	COP \$10.886

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Cassava starch	100%	10.00 kg	COP \$190.000
Fresh cheese/cuajada	60%	6.00 kg	COP \$202.200
Egg	20%	2.00 kg	COP \$30.000
Liquid milk	25%	2.50 kg	COP \$16.250
Butter	10%	1.00 kg	COP \$45.000
Salt	1%	0.10 kg	COP \$220
TOTAL INGREDIENTS		21.60 kg	COP \$483.670

Cassava cheese bread · Process and commercial control

PROCESS FLOW

Weigh → Grate/smooth cheese → Mix → Divide and round → Bake → Cool → Pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	5-8 min
Fermentation/rest	rest 10-15 min
Baking	200-215°C, 15-20 min
Cooling	30 min
Applied baking loss	8%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Grater, mixer, divider, oven	• Elasticidad • expansion • Cheese without suero libre • baked center

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	COP \$483.670
Batch packaging	COP \$17.160
Provisional processing burden	COP \$217.652
Total batch cost	COP \$718.482
Cost per retail unit	COP \$10.886
Commercial presentation	Paper bag, 6/300 g
Indicative shelf life	1 day
Technical note	Avoid excess milk, which produces flat pieces.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Colombia · Technical Sheet 10

Almojábana cheese bread

Technology family: Cheese and starch

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	12.00 kg	11.04 kg	30 x 0.36 kg	COP \$18.092

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Fresh cheese/cuajada	100%	10.00 kg	COP \$337.000
Milk powder	4%	0.40 kg	COP \$18.000
Cassava starch	4%	0.40 kg	COP \$7.600
Wheat flour	8%	0.80 kg	COP \$4.136
Sugar	4%	0.40 kg	COP \$2.200
TOTAL INGREDIENTS		12.00 kg	COP \$368.936

Almojábana cheese bread · Process and commercial control

PROCESS FLOW

Weigh → Grate/smooth cheese → Mix → Divide and round → Bake → Cool → Pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	Low speed until Uniformity
Fermentation/rest	without Proofing
Baking	230°C, 15-20 min
Cooling	30 min
Applied baking loss	8%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Grater, mixer, rounder, oven	• Cheese/cuajada • dough soft • puffing • browning • base without quemar

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	COP \$368.936
Batch packaging	COP \$7.800
Provisional processing burden	COP \$166.021
Total batch cost	COP \$542.757
Cost per retail unit	COP \$18.092
Commercial presentation	Paper bag or microperforada, 6/360 g
Indicative shelf life	1 day
Technical note	Protect the base when the oven deck transfers excessive heat.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Colombia · Technical Sheet 11

Cassava ring bread

Technology family: Cheese and starch

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	19.10 kg	14.90 kg	49 x 0.30 kg	COP \$13.321

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Cassava starch	100%	10.00 kg	COP \$190.000
Fresh cheese/cuajada	50%	5.00 kg	COP \$168.500
Egg	15%	1.50 kg	COP \$22.500
Butter	10%	1.00 kg	COP \$45.000
Liquid milk	15%	1.50 kg	COP \$9.750
Salt	1%	0.10 kg	COP \$220
TOTAL INGREDIENTS		19.10 kg	COP \$435.970

Cassava ring bread · Process and commercial control

PROCESS FLOW

Weigh → Grate/smooth cheese → Mix → Divide and round → Bake → Cool → Pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	5-7 min
Fermentation/rest	rest 10 min
Baking	180-195°C, 20-30 min; secado final
Cooling	60-90 min
Applied baking loss	22%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
mixer, extruder/moulder, oven and dryer	• Shape uniforme • crispness • final moisture • absence of rancidity • seal integrity

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	COP \$435.970
Batch packaging	COP \$20.580
Provisional processing burden	COP \$196.186
Total batch cost	COP \$652.736
Cost per retail unit	COP \$13.321
Commercial presentation	Barrier bag, 10 units/300 g
Indicative shelf life	15-30 days si aw baja
Technical note	Confirm shelf life through water-activity and microbiological testing.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Colombia · Technical Sheet 12

Cassava flatbread

Technology family: Cassava flatbread

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
20 kg of base 100%	20.10 kg	9.04 kg	18 x 0.50 kg	COP \$5.371

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
dough of yuca prensada	100%	20.00 kg	COP \$60.000
Salt	0.5%	0.10 kg	COP \$220
TOTAL INGREDIENTS		20.10 kg	COP \$60.220

Cassava flatbread · Process and commercial control

PROCESS FLOW

Receive and wash cassava → Peel/grate → Press and detoxify → Sieve → Spread on griddle → Cook and dry → Cool/pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	No aplica; desmenuzado and cernido
Fermentation/rest	No fermenta
Baking	griddle 180-220°C, 3-5 min por lado; secado adicional
Cooling	60 min
Applied baking loss	55%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Washer, peeler, Grater, press, sieve, griddle, dryer	• Detoxification • pressing • final moisture • absence of foreign matter • integrity

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	COP \$60.220
Batch packaging	COP \$9.360
Provisional processing burden	COP \$27.099
Total batch cost	COP \$96.679
Cost per retail unit	COP \$5.371
Commercial presentation	Barrier bag, disco of 500 g
Indicative shelf life	60-120 days seco
Technical note	Bitter cassava requires specialist knowledge and verified detoxification controls.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

CHILE — 12 TECHNICAL SHEETS

The following sheets cover the selected Chile portfolio. Costs are stated in CLP and referenced to July 2026.

Chile · Technical Sheet 01

Marraqueta

Technology family: Lean fermented

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	16.40 kg	13.45 kg	33 x 0.40 kg	CLP \$620

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	CLP \$10.500
Water	60%	6.00 kg	CLP \$24
Fresh yeast	1.5%	0.15 kg	CLP \$1.350
Salt	2%	0.20 kg	CLP \$108
Malt/mejorador	0.5%	50 g	CLP \$500
TOTAL INGREDIENTS		16.40 kg	CLP \$12.482

Marraqueta · Process and commercial control

PROCESS FLOW

Weigh → Mix and knead → Proof → Divide and shape → Final proof → Steam bake → Cool and pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	8-12 min
Fermentation/rest	Bulk 45-60 min; final 35-50 min at 30-34°C
Baking	220-240°C, 16-22 min, steam inicial
Cooling	60 min
Applied baking loss	18%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, divider, rounder, marraqueta marker, proofing chamber, steam-injection oven	• Corte central definido • crust crisp • crumb aireada • Weight • volume

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	CLP \$12.482
Batch packaging	CLP \$2.970
Provisional processing burden	CLP \$4.993
Total batch cost	CLP \$20.445
Cost per retail unit	CLP \$620
Commercial presentation	Paper bag or sold by weight, 4/400 g
Indicative shelf life	Same day
Technical note	Use staggered production for fresh sale.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Chile · Technical Sheet 02

Hallulla

Technology family: Laminated/fat-rich

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	17.00 kg	14.96 kg	37 x 0.40 kg	CLP \$1.007

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	CLP \$10.500
Water	45%	4.50 kg	CLP \$18
Margarine/shortening	18%	1.80 kg	CLP \$11.448
Fresh yeast	2%	0.20 kg	CLP \$1.800
Sugar	3%	0.30 kg	CLP \$357
Salt	2%	0.20 kg	CLP \$108
TOTAL INGREDIENTS		17.00 kg	CLP \$24.231

Hallulla · Process and commercial control

PROCESS FLOW

Weigh and mix → Rest → Sheet → Fold → Cut/shape → Proof if applicable → Bake → Cool

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	8-10 min
Fermentation/rest	rest 20 min; final 30-40 min
Baking	190-205°C, 15-20 min
Cooling	45 min
Applied baking loss	12%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, dough sheeter, cutter circular, docker, proofing chamber, oven	• Thickness • Lamination • docking • color • crumb compact tender

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	CLP \$24.231
Batch packaging	CLP \$3.330
Provisional processing burden	CLP \$9.692
Total batch cost	CLP \$37.253
Cost per retail unit	CLP \$1.007
Commercial presentation	Sealed bag, 4/400 g
Indicative shelf life	2-3 days
Technical note	Control sheeting to avoid excessive toughness.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Chile · Technical Sheet 03

Kneaded country roll

Technology family: Enriched

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	17.20 kg	15.14 kg	37 x 0.40 kg	CLP \$935

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	CLP \$10.500
Water	50%	5.00 kg	CLP \$20
Margarine/shortening	15%	1.50 kg	CLP \$9.540
Fresh yeast	2%	0.20 kg	CLP \$1.800
Sugar	3%	0.30 kg	CLP \$357
Salt	2%	0.20 kg	CLP \$108
TOTAL INGREDIENTS		17.20 kg	CLP \$22.325

Kneaded country roll · Process and commercial control

PROCESS FLOW

Weigh → Mix → Knead → Rest → Divide and shape → Proof → Glaze and bake → Cool/pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	8-12 min
Fermentation/rest	Bulk 40 min; final 30-45 min
Baking	190-205°C, 18-22 min
Cooling	50 min
Applied baking loss	12%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, divider, rounder, docker, proofing chamber, oven	• Shape redonda • docking • color • suavidad • Weight

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	CLP \$22.325
Batch packaging	CLP \$3.330
Provisional processing burden	CLP \$8.930
Total batch cost	CLP \$34.585
Cost per retail unit	CLP \$935
Commercial presentation	Sealed bag, 4/400 g
Indicative shelf life	2-3 days
Technical note	May be baked in at deck or rotary oven.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Chile · Technical Sheet 04

Dobladita folded bread

Technology family: Laminated/fat-rich

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	16.85 kg	14.83 kg	35 x 0.42 kg	CLP \$1.078

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	CLP \$10.500
Water	45%	4.50 kg	CLP \$18
Margarine/shortening	20%	2.00 kg	CLP \$12.720
Fresh yeast	1.5%	0.15 kg	CLP \$1.350
Salt	2%	0.20 kg	CLP \$108
TOTAL INGREDIENTS		16.85 kg	CLP \$24.696

Dobladita folded bread · Process and commercial control

PROCESS FLOW

Weigh and mix → Rest → Sheet → Fold → Cut/shape → Proof if applicable → Bake → Cool

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	8-10 min
Fermentation/rest	rest 20 min; final 25-35 min
Baking	195-205°C, 15-18 min
Cooling	45 min
Applied baking loss	12%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, sheeter, folder manual/automatic, cuttera, oven	• Visible layers • Shape • uniform fat distribution • browning • texture

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	CLP \$24.696
Batch packaging	CLP \$3.150
Provisional processing burden	CLP \$9.878
Total batch cost	CLP \$37.724
Cost per retail unit	CLP \$1.078
Commercial presentation	Sealed bag, 6/420 g
Indicative shelf life	2-3 days
Technical note	Keep fat plastic, not melted.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Chile · Technical Sheet 05

Coliza folded bread

Technology family: Laminated/fat-rich

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	17.10 kg	15.05 kg	37 x 0.40 kg	CLP \$1.007

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	CLP \$10.500
Water	46%	4.60 kg	CLP \$18
Margarine/shortening	18%	1.80 kg	CLP \$11.448
Fresh yeast	2%	0.20 kg	CLP \$1.800
Sugar	3%	0.30 kg	CLP \$357
Salt	2%	0.20 kg	CLP \$108
TOTAL INGREDIENTS		17.10 kg	CLP \$24.231

Coliza folded bread · Process and commercial control

PROCESS FLOW

Weigh and mix → Rest → Sheet → Fold → Cut/shape → Proof if applicable → Bake → Cool

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	8-10 min
Fermentation/rest	rest 20 min; final 30-40 min
Baking	190-205°C, 15-20 min
Cooling	45 min
Applied baking loss	12%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, dough sheeter, cuttera, moulder, proofing chamber, oven	• Folding • Shape rectangular/cuadrada • color • crumb • Weight

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	CLP \$24.231
Batch packaging	CLP \$3.330
Provisional processing burden	CLP \$9.693
Total batch cost	CLP \$37.254
Cost per retail unit	CLP \$1.007
Commercial presentation	Sealed bag, 4/400 g
Indicative shelf life	2-3 days
Technical note	Standardize geometry with at template.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Chile · Technical Sheet 06

Churrasca griddle bread

Technology family: Flat/quick

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	16.50 kg	14.85 kg	37 x 0.40 kg	CLP \$874

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	CLP \$10.500
Water	50%	5.00 kg	CLP \$20
Margarine/shortening	10%	1.00 kg	CLP \$6.360
Baking powder	3%	0.30 kg	CLP \$2.400
Salt	2%	0.20 kg	CLP \$108
TOTAL INGREDIENTS		16.50 kg	CLP \$19.388

Churrasca griddle bread · Process and commercial control

PROCESS FLOW

Weigh → Mix → Short rest → Sheet/shape → Cook on griddle/in oven → Cool → Pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	4-6 min
Fermentation/rest	rest 15-20 min
Baking	griddle 190-220°C, 3-5 min por lado
Cooling	20 min
Applied baking loss	10%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
mixer, sheeter, cutter, griddle or tunnel	• Thickness • even baking on both sides • toasted spots • flexibility • Weight

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	CLP \$19.388
Batch packaging	CLP \$5.180
Provisional processing burden	CLP \$7.755
Total batch cost	CLP \$32.323
Cost per retail unit	CLP \$874
Commercial presentation	Bag, 4/400 g
Indicative shelf life	1-2 days
Technical note	Do not overmix; excessive mixing causes toughness.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Chile · Technical Sheet 07

Ember-baked flatbread

Technology family: Flat/quick

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	16.60 kg	14.61 kg	40 x 0.36 kg	CLP \$835

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	CLP \$10.500
Water	50%	5.00 kg	CLP \$20
Margarine/shortening	12%	1.20 kg	CLP \$7.632
Baking powder	2%	0.20 kg	CLP \$1.600
Salt	2%	0.20 kg	CLP \$108
TOTAL INGREDIENTS		16.60 kg	CLP \$19.860

Ember-baked flatbread · Process and commercial control

PROCESS FLOW

Weigh → Mix → Short rest → Sheet/shape → Cook on griddle/in oven → Cool → Pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	5-7 min
Fermentation/rest	rest 20 min
Baking	Rescoldo 15-25 min or oven 210°C, 15-20 min
Cooling	30 min
Applied baking loss	12%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, worktable, trays; traditional area or oven controlado	• absence of adhered ash • Baking central • Thickness • color • hygiene

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	CLP \$19.860
Batch packaging	CLP \$5.600
Provisional processing burden	CLP \$7.944
Total batch cost	CLP \$33.404
Cost per retail unit	CLP \$835
Commercial presentation	Paper bag, 2/360 g
Indicative shelf life	1-2 days
Technical note	For formal sale, use at controlled oven or at validated ember-baking protocol.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Chile · Technical Sheet 08

Frica sandwich roll

Technology family: Enriched

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	17.20 kg	15.14 kg	37 x 0.40 kg	CLP \$775

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	CLP \$10.500
Water	55%	5.50 kg	CLP \$22
Margarine/shortening	8%	0.80 kg	CLP \$5.088
Sugar	5%	0.50 kg	CLP \$595
Fresh yeast	2%	0.20 kg	CLP \$1.800
Salt	2%	0.20 kg	CLP \$108
TOTAL INGREDIENTS		17.20 kg	CLP \$18.113

Frica sandwich roll · Process and commercial control

PROCESS FLOW

Weigh → Mix → Knead → Rest → Divide and shape → Proof → Glaze and bake → Cool/pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	10-12 min
Fermentation/rest	Bulk 40 min; final 45 min
Baking	185-195°C, 16-20 min
Cooling	50 min
Applied baking loss	12%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, divider, rounder, aplanadora, proofing chamber, oven	• Diameter • height • suavidad • color • cutting resistance

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	CLP \$18.113
Batch packaging	CLP \$3.330
Provisional processing burden	CLP \$7.245
Total batch cost	CLP \$28.688
Cost per retail unit	CLP \$775
Commercial presentation	Sealed bag, 4/400 g
Indicative shelf life	3 days
Technical note	Designed for sandwiches; standardize diameter.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Chile · Technical Sheet 09

Chilean hot-dog roll

Technology family: Enriched

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	18.50 kg	16.28 kg	38 x 0.42 kg	CLP \$893

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	CLP \$10.500
Water	50%	5.00 kg	CLP \$20
Liquid milk	10%	1.00 kg	CLP \$1.090
Sugar	8%	0.80 kg	CLP \$952
Margarine/shortening	8%	0.80 kg	CLP \$5.088
Egg	5%	0.50 kg	CLP \$2.250
Fresh yeast	2%	0.20 kg	CLP \$1.800
Salt	2%	0.20 kg	CLP \$108
TOTAL INGREDIENTS		18.50 kg	CLP \$21.808

Chilean hot-dog roll · Process and commercial control

PROCESS FLOW

Weigh → Mix → Knead → Rest → Divide and shape → Proof → Glaze and bake → Cool/pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	10-14 min
Fermentation/rest	Bulk 40 min; final 45-60 min
Baking	180-190°C, 14-18 min
Cooling	60 min
Applied baking loss	12%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, divider, rounder, roll moulder, proofing chamber, oven	• Length uniforme • suavidad • crust thin • volume • Weight

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	CLP \$21.808
Batch packaging	CLP \$3.420
Provisional processing burden	CLP \$8.723
Total batch cost	CLP \$33.951
Cost per retail unit	CLP \$893
Commercial presentation	Sealed bag, 6/420 g
Indicative shelf life	3-4 days
Technical note	Avoid overbaking to preserve flexibility.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Chile · Technical Sheet 10

Sandwich loaf

Technology family: Pan loaf

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	17.90 kg	15.75 kg	24 x 0.65 kg	CLP \$1.189

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	CLP \$10.500
Water	55%	5.50 kg	CLP \$22
Liquid milk	10%	1.00 kg	CLP \$1.090
Sugar	5%	0.50 kg	CLP \$595
Margarine/shortening	5%	0.50 kg	CLP \$3.180
Fresh yeast	2%	0.20 kg	CLP \$1.800
Salt	2%	0.20 kg	CLP \$108
TOTAL INGREDIENTS		17.90 kg	CLP \$17.295

Sandwich loaf · Process and commercial control

PROCESS FLOW

Weigh → Knead → Proof → Dividir/moldear → Final proof in pan → Bake → Depan/cool → Slice/pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	10-14 min
Fermentation/rest	Bulk 45 min; Final proof in pan 45-70 min
Baking	185-200°C, 28-35 min
Cooling	2-3 h before rebanar
Applied baking loss	12%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, divider, moldeadora, pans/lids, proofing chamber, oven, slicer	• height • Shape • crumb thin • moisture • cooling before slicing • seal integrity

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	CLP \$17.295
Batch packaging	CLP \$4.320
Provisional processing burden	CLP \$6.918
Total batch cost	CLP \$28.533
Cost per retail unit	CLP \$1.189
Commercial presentation	Sealed bag, 1 loaf 650 g
Indicative shelf life	4-7 days without preservatives
Technical note	Validate shelf life for molds and water activity.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Chile · Technical Sheet 11

Whole-wheat bread

Technology family: Whole grain

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	17.60 kg	15.31 kg	23 x 0.65 kg	CLP \$1.214

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	70%	7.00 kg	CLP \$7.350
Whole-wheat flour	30%	3.00 kg	CLP \$4.800
Water	65%	6.50 kg	CLP \$26
Sugar	3%	0.30 kg	CLP \$357
Margarine/shortening	4%	0.40 kg	CLP \$2.544
Fresh yeast	2%	0.20 kg	CLP \$1.800
Salt	2%	0.20 kg	CLP \$108
TOTAL INGREDIENTS		17.60 kg	CLP \$16.985

Whole-wheat bread · Process and commercial control

PROCESS FLOW

Weigh and prehydrate → Knead → Proof → Divide/shape → Final proof → Bake → Cool/pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	Autolyse 15 min + kneading 10 min
Fermentation/rest	Bulk 50 min; final 50-70 min
Baking	185-200°C, 30-38 min
Cooling	2-3 h
Applied baking loss	13%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, pans, proofing chamber, oven, slicer	• hydration • Distribution of bran • volume • crumb • absence of zonas crudas

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	CLP \$16.985
Batch packaging	CLP \$4.140
Provisional processing burden	CLP \$6.794
Total batch cost	CLP \$27.919
Cost per retail unit	CLP \$1.214
Commercial presentation	Sealed bag, loaf 650 g
Indicative shelf life	4-6 days
Technical note	Seeds may be included when properly declared on the label.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Chile · Technical Sheet 12

Chilean Christmas bread

Technology family: Sweet/festive

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	37.60 kg	33.84 kg	67 x 0.50 kg	CLP \$3.986

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	CLP \$10.500
Sugar	70%	7.00 kg	CLP \$8.330
Butter	50%	5.00 kg	CLP \$49.800
Egg	50%	5.00 kg	CLP \$22.500
Liquid milk	20%	2.00 kg	CLP \$2.180
fruit secas/confitadas	80%	8.00 kg	CLP \$84.000
Baking powder	3%	0.30 kg	CLP \$2.400
Especias/aromas	2%	0.20 kg	CLP \$2.400
Salt	1%	0.10 kg	CLP \$54
TOTAL INGREDIENTS		37.60 kg	CLP \$182.164

Chilean Christmas bread · Process and commercial control

PROCESS FLOW

Prepare ingredients → Knead enriched dough → Add fruit → Rest/shape → Proof or mature → Bake → Cool thoroughly → Wrap

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	Batido/mezcla 10-15 min; fruit al final
Fermentation/rest	Optional maturation 30 min; no Proofing si usa polvo
Baking	160-175°C, 55-75 min
Cooling	4-6 h
Applied baking loss	10%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Planetary mixer, doser, pans, oven, Cooling, wrapper	• Distribution of fruit • Baking central • Weight • moisture • rancidity • seal integrity

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	CLP \$182.164
Batch packaging	CLP \$12.060
Provisional processing burden	CLP \$72.866
Total batch cost	CLP \$267.090
Cost per retail unit	CLP \$3.986
Commercial presentation	Film barrera + caja, 500 g
Indicative shelf life	30-60 days according to formula and package
Technical note	Confirm nutrition warnings and shelf life through testing.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

ARGENTINA — 12 TECHNICAL SHEETS

The following sheets cover the selected Argentina portfolio. Costs are stated in ARS and referenced to July 2026.

Argentina · Technical Sheet 01

French loaf / flauta

Technology family: Lean fermented

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	16.45 kg	13.49 kg	53 x 0.25 kg	ARS \$434

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	ARS \$8.160
Water	60%	6.00 kg	ARS \$12
Fresh yeast	2%	0.20 kg	ARS \$1.200
Salt	2%	0.20 kg	ARS \$48
Malt/mejorador	0.5%	50 g	ARS \$250
TOTAL INGREDIENTS		16.45 kg	ARS \$9.670

French loaf / flauta · Process and commercial control

PROCESS FLOW

Weigh → Mix and knead → Proof → Divide and shape → Final proof → Steam bake → Cool and pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	8-12 min
Fermentation/rest	Bulk 45-60 min; final 35-50 min
Baking	220-240°C, 20-28 min, steam
Cooling	60 min
Applied baking loss	18%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, divider, moulder, proofing chamber, steam-injection oven	• Cortes • crust • crumb • Weight • Baking

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	ARS \$9.670
Batch packaging	ARS \$8.480
Provisional processing burden	ARS \$4.835
Total batch cost	ARS \$22.986
Cost per retail unit	ARS \$434
Commercial presentation	Paper bag or sold by weight, 250 g
Indicative shelf life	Same day
Technical note	High-turnover core line.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Argentina · Technical Sheet 02

Miñón / roseta rolls

Technology family: Lean fermented

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	16.40 kg	13.61 kg	45 x 0.30 kg	ARS \$516

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	ARS \$8.160
Water	58%	5.80 kg	ARS \$12
Fresh yeast	2%	0.20 kg	ARS \$1.200
Salt	2%	0.20 kg	ARS \$48
Margarine/shortening	2%	0.20 kg	ARS \$1.272
TOTAL INGREDIENTS		16.40 kg	ARS \$10.692

Miñón / roseta rolls · Process and commercial control

PROCESS FLOW

Weigh → Mix and knead → Proof → Divide and shape → Final proof → Steam bake → Cool and pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	8-12 min
Fermentation/rest	Bulk 45 min; final 35-45 min
Baking	215-230°C, 12-16 min
Cooling	45 min
Applied baking loss	17%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, divider, rounder, roseta marker, proofing chamber, oven	• Shape • marking • crust • crumb • Weight

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	ARS \$10.692
Batch packaging	ARS \$7.200
Provisional processing burden	ARS \$5.346
Total batch cost	ARS \$23.238
Cost per retail unit	ARS \$516
Commercial presentation	Paper bag, 6/300 g
Indicative shelf life	1 day
Technical note	May be produced on the same line as French bread.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Argentina · Technical Sheet 03

Country bread

Technology family: Lean fermented

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	17.05 kg	14.15 kg	28 x 0.50 kg	ARS \$815

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	ARS \$8.160
Water	65%	6.50 kg	ARS \$13
Fresh yeast	1.5%	0.15 kg	ARS \$900
Salt	2%	0.20 kg	ARS \$48
Oil	2%	0.20 kg	ARS \$500
TOTAL INGREDIENTS		17.05 kg	ARS \$9.621

Country bread · Process and commercial control

PROCESS FLOW

Weigh → Mix and knead → Proof → Divide and shape → Final proof → Steam bake → Cool and pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	10-14 min
Fermentation/rest	Bulk 60-90 min with pliegues; final 45-60 min
Baking	210-230°C, 30-40 min
Cooling	90 min
Applied baking loss	17%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, worktable, bannetons, proofing chamber, deck/rotary oven	• Proofing • scoring • baked base • cell structure • Weight

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	ARS \$9.621
Batch packaging	ARS \$8.400
Provisional processing burden	ARS \$4.811
Total batch cost	ARS \$22.832
Cost per retail unit	ARS \$815
Commercial presentation	Paper bag or microperforated film, 500 g
Indicative shelf life	2 days
Technical note	Sourdough starter may be incorporated with adjusted timings.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Argentina · Technical Sheet 04

Laminated lard bread

Technology family: Laminated/fat-rich

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	17.30 kg	15.22 kg	50 x 0.30 kg	ARS \$927

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	ARS \$8.160
Water	42%	4.20 kg	ARS \$8
Margarine/shortening	25%	2.50 kg	ARS \$15.900
Fresh yeast	2%	0.20 kg	ARS \$1.200
Sugar	2%	0.20 kg	ARS \$260
Salt	2%	0.20 kg	ARS \$48
TOTAL INGREDIENTS		17.30 kg	ARS \$25.577

Laminated lard bread · Process and commercial control

PROCESS FLOW

Weigh and mix → Rest → Sheet → Fold → Cut/shape → Proof if applicable → Bake → Cool

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	8-10 min
Fermentation/rest	rest 20 min; final 25-35 min
Baking	190-205°C, 15-20 min
Cooling	45 min
Applied baking loss	12%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, dough sheeter, cutter/moulder, proofing chamber, oven	• Lamination • Shortening distribuida • Shape • crispness externa • Weight

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	ARS \$25.577
Batch packaging	ARS \$8.000
Provisional processing burden	ARS \$12.788
Total batch cost	ARS \$46.365
Cost per retail unit	ARS \$927
Commercial presentation	Sealed bag, 6/300 g
Indicative shelf life	3-4 days
Technical note	Control rancidity and fat-storage conditions.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Argentina · Technical Sheet 05

Criollo layered roll

Technology family: Laminated/fat-rich

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	17.20 kg	15.14 kg	36 x 0.42 kg	ARS \$1.099

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	ARS \$8.160
Water	45%	4.50 kg	ARS \$9
Margarine/shortening	20%	2.00 kg	ARS \$12.720
Fresh yeast	2%	0.20 kg	ARS \$1.200
Sugar	3%	0.30 kg	ARS \$390
Salt	2%	0.20 kg	ARS \$48
TOTAL INGREDIENTS		17.20 kg	ARS \$22.527

Criollo layered roll · Process and commercial control

PROCESS FLOW

Weigh and mix → Rest → Sheet → Fold → Cut/shape → Proof if applicable → Bake → Cool

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	8-10 min
Fermentation/rest	rest 20 min; final 30-40 min
Baking	190-205°C, 16-20 min
Cooling	45 min
Applied baking loss	12%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, sheeter, folder, cuttera, proofing chamber, oven	• Layers • Shape • color • texture • Weight

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	ARS \$22.527
Batch packaging	ARS \$5.760
Provisional processing burden	ARS \$11.264
Total batch cost	ARS \$39.551
Cost per retail unit	ARS \$1.099
Commercial presentation	Sealed bag, 6/420 g
Indicative shelf life	3 days
Technical note	Standardize the number of folds.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Argentina · Technical Sheet 06

Figacita roll

Technology family: Enriched

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	17.90 kg	15.75 kg	52 x 0.30 kg	ARS \$709

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	ARS \$8.160
Water	50%	5.00 kg	ARS \$10
Liquid milk	10%	1.00 kg	ARS \$2.620
Sugar	5%	0.50 kg	ARS \$650
Margarine/shortening	10%	1.00 kg	ARS \$6.360
Fresh yeast	2%	0.20 kg	ARS \$1.200
Salt	2%	0.20 kg	ARS \$48
TOTAL INGREDIENTS		17.90 kg	ARS \$19.048

Figacita roll · Process and commercial control

PROCESS FLOW

Weigh → Mix → Knead → Rest → Divide and shape → Proof → Glaze and bake → Cool/pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	10-12 min
Fermentation/rest	Bulk 40 min; final 40-50 min
Baking	180-190°C, 13-17 min
Cooling	45 min
Applied baking loss	12%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, divider, rounder, aplanadora, proofing chamber, oven	• Diameter • height • suavidad • color • Weight

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	ARS \$19.048
Batch packaging	ARS \$8.320
Provisional processing burden	ARS \$9.524
Total batch cost	ARS \$36.893
Cost per retail unit	ARS \$709
Commercial presentation	Sealed bag, 6/300 g
Indicative shelf life	3 days
Technical note	Ideal for lunch and catering service.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Argentina · Technical Sheet 07

Pebete sandwich roll

Technology family: Enriched

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	18.50 kg	16.28 kg	33 x 0.48 kg	ARS \$1.360

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	ARS \$8.160
Water	45%	4.50 kg	ARS \$9
Liquid milk	15%	1.50 kg	ARS \$3.930
Sugar	8%	0.80 kg	ARS \$1.040
Butter	8%	0.80 kg	ARS \$9.504
Fresh yeast	2%	0.20 kg	ARS \$1.200
Salt	2%	0.20 kg	ARS \$48
Egg	5%	0.50 kg	ARS \$2.500
TOTAL INGREDIENTS		18.50 kg	ARS \$26.391

Pebete sandwich roll · Process and commercial control

PROCESS FLOW

Weigh → Mix → Knead → Rest → Divide and shape → Proof → Glaze and bake → Cool/pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	10-14 min
Fermentation/rest	Bulk 40 min; final 50-60 min
Baking	180-190°C, 15-18 min
Cooling	60 min
Applied baking loss	12%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, divider, moulder, proofing chamber, oven	• Oval shape • gloss • suavidad • crust thin • Weight

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	ARS \$26.391
Batch packaging	ARS \$5.280
Provisional processing burden	ARS \$13.196
Total batch cost	ARS \$44.867
Cost per retail unit	ARS \$1.360
Commercial presentation	Sealed bag, 6/480 g
Indicative shelf life	3-4 days
Technical note	Suitable for food-service sales.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Argentina · Technical Sheet 08

Vienna roll

Technology family: Enriched

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	17.70 kg	15.58 kg	43 x 0.36 kg	ARS \$780

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	ARS \$8.160
Water	50%	5.00 kg	ARS \$10
Liquid milk	10%	1.00 kg	ARS \$2.620
Sugar	5%	0.50 kg	ARS \$650
Margarine/shortening	8%	0.80 kg	ARS \$5.088
Fresh yeast	2%	0.20 kg	ARS \$1.200
Salt	2%	0.20 kg	ARS \$48
TOTAL INGREDIENTS		17.70 kg	ARS \$17.776

Vienna roll · Process and commercial control

PROCESS FLOW

Weigh → Mix → Knead → Rest → Divide and shape → Proof → Glaze and bake → Cool/pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	10-12 min
Fermentation/rest	Bulk 40 min; final 45-55 min
Baking	180-190°C, 14-17 min
Cooling	50 min
Applied baking loss	12%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, divider, roll moulder, proofing chamber, oven	• Length • volume • suavidad • Weight • cutting resistance

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	ARS \$17.776
Batch packaging	ARS \$6.880
Provisional processing burden	ARS \$8.888
Total batch cost	ARS \$33.545
Cost per retail unit	ARS \$780
Commercial presentation	Sealed bag, 6/360 g
Indicative shelf life	3 days
Technical note	May share the hot-dog-roll production line.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Argentina · Technical Sheet 09

Soft sandwich loaf

Technology family: Pan loaf

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	18.10 kg	15.93 kg	24 x 0.65 kg	ARS \$1.503

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	ARS \$8.160
Water	45%	4.50 kg	ARS \$9
Liquid milk	20%	2.00 kg	ARS \$5.240
Sugar	6%	0.60 kg	ARS \$780
Margarine/shortening	6%	0.60 kg	ARS \$3.816
Fresh yeast	2%	0.20 kg	ARS \$1.200
Salt	2%	0.20 kg	ARS \$48
TOTAL INGREDIENTS		18.10 kg	ARS \$19.253

Soft sandwich loaf · Process and commercial control

PROCESS FLOW

Weigh → Knead → Proof → Dividir/moldear → Final proof in pan → Bake → Depan/cool → Slice/pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	10-14 min
Fermentation/rest	Bulk 45 min; prueba molde 50-70 min
Baking	185-200°C, 30-38 min
Cooling	2-3 h before rebanar
Applied baking loss	12%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, moldeadora, pans, proofing chamber, oven, slicer, bagger	• Shape • crumb thin • moisture • Cooling • seal integrity • molds

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	ARS \$19.253
Batch packaging	ARS \$7.200
Provisional processing burden	ARS \$9.627
Total batch cost	ARS \$36.080
Cost per retail unit	ARS \$1.503
Commercial presentation	Sealed bag, loaf 650 g
Indicative shelf life	4-7 days without preservatives
Technical note	Validate shelf life and Argentine Food Code labeling.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Argentina · Technical Sheet 10

Whole-wheat bread

Technology family: Whole grain

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	17.70 kg	15.40 kg	23 x 0.65 kg	ARS \$1.227

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	70%	7.00 kg	ARS \$5.712
Whole-wheat flour	30%	3.00 kg	ARS \$4.170
Water	65%	6.50 kg	ARS \$13
Sugar	4%	0.40 kg	ARS \$520
Margarine/shortening	4%	0.40 kg	ARS \$2.544
Fresh yeast	2%	0.20 kg	ARS \$1.200
Salt	2%	0.20 kg	ARS \$48
TOTAL INGREDIENTS		17.70 kg	ARS \$14.207

Whole-wheat bread · Process and commercial control

PROCESS FLOW

Weigh and prehydrate → Knead → Proof → Divide/shape → Final proof → Bake → Cool/pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	Autolyse 15 min + 10 min kneading
Fermentation/rest	Bulk 50 min; final 50-70 min
Baking	185-200°C, 32-40 min
Cooling	2-3 h
Applied baking loss	13%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, pans, proofing chamber, oven, slicer	• hydration • fiber • volume • crumb • Baking • molds

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	ARS \$14.207
Batch packaging	ARS \$6.900
Provisional processing burden	ARS \$7.104
Total batch cost	ARS \$28.211
Cost per retail unit	ARS \$1.227
Commercial presentation	Sealed bag, loaf 650 g
Indicative shelf life	4-6 days
Technical note	Product name and composition must comply with the Argentine Food Code.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Argentina · Technical Sheet 11

Breadsticks

Technology family: Flat/quick

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	16.35 kg	12.26 kg	61 x 0.20 kg	ARS \$500

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	ARS \$8.160
Water	50%	5.00 kg	ARS \$10
Oil	8%	0.80 kg	ARS \$2.000
Fresh yeast	1.5%	0.15 kg	ARS \$900
Salt	2%	0.20 kg	ARS \$48
Sugar	2%	0.20 kg	ARS \$260
TOTAL INGREDIENTS		16.35 kg	ARS \$11.378

Breadsticks · Process and commercial control

PROCESS FLOW

Weigh → Mix → Short rest → Sheet/shape → Cook on griddle/in oven → Cool → Pack

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	8-10 min
Fermentation/rest	rest 30 min
Baking	170-190°C, 18-28 min + secado
Cooling	60-90 min
Applied baking loss	25%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer, sheeter/extruder, cuttera, oven/dryer, envasadora	• Diameter • crispness • final moisture • breakage • seal integrity

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	ARS \$11.378
Batch packaging	ARS \$13.420
Provisional processing burden	ARS \$5.689
Total batch cost	ARS \$30.488
Cost per retail unit	ARS \$500
Commercial presentation	Barrier bag, 200 g
Indicative shelf life	45-90 days
Technical note	Shelf life depends on the package moisture barrier.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

Argentina · Technical Sheet 12

Sweet bread / panettone

Technology family: Sweet/festive

Base batch	Total dough	Final yield	Retail units	Estimated unit cost
10 kg flour basis (100%)	31.20 kg	28.08 kg	56 x 0.50 kg	ARS \$5.455

FORMULA AND BATCH QUANTITIES

Ingredient	Baker's %	Batch quantity	Estimated cost
Wheat flour	100%	10.00 kg	ARS \$8.160
Liquid milk	35%	3.50 kg	ARS \$9.170
Egg	35%	3.50 kg	ARS \$17.500
Sugar	35%	3.50 kg	ARS \$4.550
Butter	30%	3.00 kg	ARS \$35.640
Fresh yeast	4%	0.40 kg	ARS \$2.400
fruit secas/confitadas	70%	7.00 kg	ARS \$112.000
Especias/aromas	2%	0.20 kg	ARS \$3.000
Salt	1%	0.10 kg	ARS \$24
TOTAL INGREDIENTS		31.20 kg	ARS \$192.444

Sweet bread / panettone · Process and commercial control

PROCESS FLOW

Prepare ingredients → Knead enriched dough → Add fruit → Rest/shape → Proof or mature → Bake → Cool thoroughly → Wrap

STARTING PROCESS PARAMETERS

Parameter	Starting specification
Mezclado/kneading	15-20 min; fruit al final
Fermentation/rest	Prefermento 30-60 min; final 90-180 min
Baking	165-180°C, 40-60 min
Cooling	6-8 h
Applied baking loss	10%

EQUIPMENT AND QUALITY CONTROLS

Minimum equipment	Quality controls
Mixer of alta capacidad, doser of fruit, divider, pans, proofing chamber, oven, wrapper	• Gluten development • Distribution of fruit • volume • Baking central • moisture • seal integrity

COST, SHELF LIFE, AND COMMERCIAL PRESENTATION

Item	Value / specification
Raw materials per batch	ARS \$192.444
Batch packaging	ARS \$16.800
Provisional processing burden	ARS \$96.222
Total batch cost	ARS \$305.466
Cost per retail unit	ARS \$5.455
Commercial presentation	Barrier bag + caja, 500 g
Indicative shelf life	30-60 days according to package
Technical note	Use yeast designed for sweet dough and validate shelf life.

Pilot formulation; validate through plant trials. Values and shelf life require local verification before commercialization.

8. EQUIPMENT, QUALITY, HYGIENE, AND TRACEABILITY

Area	Recommended equipment/infrastructure
Receiving	Platform scale, hygienic pallets, shelving, thermometers, and quarantine zone.
Preparation	Precision scale, sifter, stainless-steel tables, cheese grater, and dosing equipment.
Dough room	50–100 kg spiral mixer, paddle mixer for starch products, and planetary mixer.
Forming	Divider, rounder, sheeter, bar moulder, cutters, and pans.
Proofing	Temperature- and humidity-controlled chamber; racks and trays.
Baking	Rotary or deck oven with steam; griddle for flat breads; dryer for crisp products.
Post-bake	Cooling racks, slicer, scale-appropriate metal detector, sealers, and labeler.
Utilities	Extraction, potable water, handwashing, utensil washing, pest control, waste, and maintenance.

Minimum quality-control plan

- Receiving: approved supplier, batch, date, integrity, chilled temperature, and no infestation.
- Flour: moisture, odor, color, absorption, and batch mixing behavior.
- Dough: final temperature, mixing time, elasticity, pH when applicable, and scaling weight.
- Proofing: time, temperature, relative humidity, and achieved volume.
- Baking: recorded temperature/time, color, weight loss, and internal temperature.
- Cooling: protection from dust and condensation; never pack hot product.
- Finished product: net weight, appearance, texture, seal, batch, date, and sensory release.
- Shelf life: molds/yeasts, water activity, rancidity, and package assessment.

SUMMARY SANITARY FRAMEWORK

Colombia: Resolution 2674 of 2013 establishes sanitary requirements for manufacture, processing, packaging, storage, transport, and sale. Applicable risk-based sanitary authorization is required [S4–S6].

Chile: The Food Sanitary Regulation, updated in February 2026, governs facilities, authorization, processing, labeling, and sale [S2–S3].

Argentina: The Argentine Food Code is continuously updated; Chapter IX governs farinaceous foods. Facilities and products must obtain applicable authorizations and registrations [S5–S6].

Suggested batch record

Field	Record	Field	Record
Product		Formula code	
Date		Shift	
Batch		Responsible person	
Flour/batch		Yeast/batch	
Final dough temperature		Proofing	
Scaling weight		Baking	
Yield		Loss	
Quality release		Observations	
Production signature		Quality signature	

9. IMPLEMENTATION ROADMAP

Period	Activity
Weeks 1-4	Define city, target customer, capacity, brand, and channels. Quote raw materials, energy, rent, and equipment.
Weeks 5-8	Set up the pilot laboratory. Test 12 flagship products, adjust formulas, and measure actual yield.
Weeks 9-12	Design layout, GMP program, cleaning sheets, traceability, labeling, and sanitary dossiers.
Months 4-6	Install the semi-industrial line, train personnel, validate batches, and launch the pilot portfolio.
Months 7-12	Expand to 24 products; add food-service and longer-shelf-life products.
Year 2	Evaluate automation, regional distribution, and the complete 36-product portfolio.

Management indicators

- Actual versus theoretical batch yield
- Total loss and commercial returns
- Actual cost per kilogram and per retail unit
- Units per labor-hour
- Energy consumption per kilogram
- Net-weight compliance
- Complaints and nonconformities
- Turnover by product and channel
- Gross margin by family
- Waste and recovery of surpluses

10. SOURCES AND OPERATING ANNEXES

- [S1] SENA. From the Oven to the Table: Practical Bakery Guide (2024).
[S2] Chilean Ministry of Health. Food Sanitary Regulation, February 2026.
[S3] Chilean Ministry of Health. Food Nutrition Labeling Manual.
[S4] Colombian Ministry of Health. Resolution 2674 of 2013.
[S5] INVIMA. Food sanitary registration guide.
[S6] ANMAT. Argentine Food Code and authorized facilities.
[S7] Chile. Cleaner Production Agreement for the bread industry.
[S8] European Union. Best Bread Production Handbook.
[S9] FAO. Appropriate equipment and methods for bread production.
[S10] Bakerpedia. Bakery-product process costing.
[S11–S13] Price references for Colombia, Chile, and Argentina, July 2026.

Annex A — Cost-updating formula

1) Update each input price per kilogram/liter. 2) Multiply batch quantity by price. 3) Add packaging. 4) Add actual labor, energy, cleaning, losses, maintenance, and overhead. 5) Divide by conforming saleable units. 6) Apply taxes, distribution, and commercial margin separately.

Annex B — Mandatory pilot validation

- Produce at least three consecutive batches per formula.
- Record dough and ambient temperature.
- Measure initial dough, finished product, and loss.
- Evaluate weight, volume, crumb, crust, flavor, and texture.
- Retain reference samples from each batch.
- Do not claim shelf life without microbiological and stability testing.
- Review allergens: gluten, milk, egg, tree nuts, and others.
- Approve labeling and registrations before packaged sale.