Thermal Processing

CCP-01B — Cooking (Ground Poultry Patties)

Parameter	Specification
CCP ID	CCP-01B (Biological)
Process Step	Continuous spiral oven cook — ground turkey patties
Hazard	Survival of Salmonella spp., Listeria monocytogenes, STEC
Critical Limit	Internal temp >=165°F (73.9°C) for >=15 sec at coldest geometric point; validated 7-log Salmonella lethality per FSIS Appendix A
Monitoring	Calibrated in-line thermocouple at oven exit (continuous) + handheld probe on 3 patties per lane every 30 min; QA operator initials on cook log
Corrective Action	Stop line; hold all product back to last compliant reading; reprocess through oven or destroy per disposition matrix; adjust belt speed/burner; root-cause and retrain; document on NCR-04
Verification	Ice bath + boiling point thermocouple calibration each shift (±2°F); daily record review by QA Manager; annual cook validation study; pre-shipment finished-product pathogen testing on defined frequency
Records	Cook log CK-101, thermocouple calibration log CAL-22, NCR-04, annual validation file

CCP-02B — HTST Pasteurization (Fluid Dairy)

Parameter	Specification
CCP ID	CCP-02B (Biological)
Process Step	HTST plate pasteurizer — whole milk
Hazard	Coxiella burnetii, Listeria monocytogenes, Salmonella, pathogenic E. coli
Critical Limit	>=161°F (71.7°C) for >=15 sec in holding tube; Flow Diversion Valve (FDV) forward flow only when STLR above cut-in; legal seals intact (PMO/Grade A)
Monitoring	Continuous circular/electronic chart recorder on holding-tube outlet; FDV position logged continuously; indicating thermometer cross-check every 30 min
Corrective Action	FDV auto-diverts to raw balance tank; re-pasteurize diverted product; isolate any downstream product if FDV lag suspected; file PMO deviation, notify state inspector if suspect product shipped

Parameter	Specification
Verification	Daily chart review & signature by PIC; monthly FDV response-time & seal integrity test by regulatory sealer; quarterly alkaline phosphatase (ALP) test <350 mU/L; annual thermometer certification
Records	HTST chart, FDV seal log, ALP results, sealer's test reports, PMO Appendix H forms

CCP-03B — Cooling (Post-Cook RTE Roast Beef)

Parameter	Specification
CCP ID	CCP-03B (Biological)
Process Step	Blast chiller cooling — cooked whole-muscle RTE beef
Hazard	Clostridium perfringens germination & outgrowth; Bacillus cereus; Staphylococcus aureus enterotoxin
Critical Limit	FSIS Appendix B — 120°F->80°F in <=1 hr AND 80°F->40°F in <=5 hr; continuous cooling from peak cook temp to <=40°F within 6.5 hrs total
Monitoring	Wireless data-logger probes (3 per rack: geometric center, surface, outer edge) at 5-min intervals; start & end temp recorded; QA reviews curve before release
Corrective Action	Hold lot; submit curve to process authority for deviation evaluation; option to re-cook, test for C. perfringens/S. aureus toxin, or destroy; investigate chiller load/fan failure
Verification	Weekly logger calibration (ice bath); annual max-load cooling validation; monthly deviation-trend review; preventive maintenance on chiller every 90 days
Records	Cooling curve file COOL-07, chiller PM log, deviation file DEV-CL, validation study

CCP-04B — Reheating (Blooming Prior to Hot Hold)

Parameter	Specification
CCP ID	CCP-04B (Biological)
Process Step	Steam-kettle reheat of refrigerated cooked product prior to hot-hold service line
Hazard	Outgrowth of C. perfringens and B. cereus vegetative cells during slow reheat
Critical Limit	Internal temp >=165°F (73.9°C) achieved within 2 hrs; agitation to ensure uniform reheat

Parameter	Specification
Monitoring	Calibrated thin-tip digital thermometer at center + 2 edge points per batch; start-time stamp on batch ticket; operator + QA sign at release
Corrective Action	Continue heating until >=165°F; if >2 hrs elapsed — destroy batch; evaluate kettle steam supply, agitator, load size
Verification	Shift-start thermometer calibration; monthly kettle temperature mapping; quarterly review of reheat log by QA Manager
Records	Reheat log RH-09, thermometer calibration log, kettle PM log

CCP-05B — Retort Processing (Low-Acid Canned Food)

Parameter	Specification
CCP ID	CCP-05B (Biological)
Process Step	Still retort — LACF canned soup (21 CFR 113)
Hazard	Survival of Clostridium botulinum spores
Critical Limit	Scheduled process per Process Authority (FDA 2541f): >=250°F (121.1°C) for scheduled time, minimum F0 >=6.0 min; complete vent schedule; initial temp >=140°F; container orientation per filed process
Monitoring	Every cycle: MIG (mercury-in-glass) thermometer + temperature recorder + pressure gauge; certified retort operator logs come-up, process, cool-down times; venting verified
Corrective Action	Hold lot on 'Retort Hold'; refer to Process Authority — re-retort only if authorized; destroy if deviation cannot be resolved; file FDA deviation report per 21 CFR 113.89 within required window
Verification	Daily MIG vs. recorder cross-check (±1°F); annual temperature-distribution & heat-penetration review; biennial Better Process Control School certification for operators/supervisors
Records	Retort chart CR-1, deviation log DEV-RT, FDA 2541f on file, operator certifications

Physical Detection

CCP-06P — Metal Detection (Post-Packaging, Frozen Entrée)

Parameter	Specification
CCP ID	CCP-06P (Physical)
Process Step	In-line metal detector immediately after final carton seal
Hazard	Metal fragments from blade wear, sieve breakage, mixer paddles
Critical Limit	Detect & reject Fe >=2.0 mm, Non-Fe >=2.5 mm, 316 SS >=3.0 mm certified test cards; locked-reject mechanism functional & fail-safe
Monitoring	3 certified test pieces passed leading/center/trailing on product at startup, every 2 hrs, after any stoppage/jam/phase change, and end of run; reject to locked bin verified; log signed each check
Corrective Action	Place all product back to last passing test on 'MD Hold'; re-run through secondary certified detector OR 100% manual inspection; engineering services unit and recertifies before restart
Verification	Daily MD log review by QA; semi-annual OEM calibration; quarterly reject-mechanism failure-mode test (power cut, air loss); trend review of rejects monthly
Records	MD log MD-12, OEM calibration certificate, reject investigation log, customer-spec sensitivity agreement

CCP-07P — X-Ray Inspection (Post-Pack, Glass-Packed)

Parameter	Specification
CCP ID	CCP-07P (Physical)
Process Step	X-ray scanner on capped glass jars post-fill/cap
Hazard	Glass shards (jar-on-jar breakage), metal, stone, dense bone, high-density plastic
Critical Limit	Detect & reject: metal >=2.0 mm, glass >=3.0 mm, stone >=5.0 mm, calcified bone >=4.0 mm per validated test kit; reject arm diverts to locked bin
Monitoring	Certified test cards run at startup, every 2 hrs, end of run, after any stoppage; image quality + reject confirmation verified each check; QA signs
Corrective Action	Hold all product back to last passing check; re-pass through certified X-ray after service; disposition rejects by QA; document in NCR

Parameter	Specification
Verification	Daily image-quality verification; monthly ALARA radiation survey; annual OEM calibration & state radiation inspection
Records	X-ray log XR-03, radiation survey reports, OEM calibration cert, test-card inventory log

CCP-08P — Pre-Op Magnet (Raw Grain Intake)

Parameter	Specification
CCP ID	CCP-08P (Physical)
Process Step	Rare-earth plate magnet in gravity chute, raw grain intake, pre-mill
Hazard	Ferrous tramp metal (field harvest debris, truck/auger wear) >=5 mm
Critical Limit	Magnet field strength >=10,000 gauss at face; no visible damage, gaps, or bypass; cleaned & free of accumulated tramp at shift start
Monitoring	Visual & integrity check each shift; tramp collected, weighed, logged; gauss-meter reading weekly
Corrective Action	If gauss <10,000 or damage found — stop intake, replace magnet, re-process last lot through certified replacement; investigate supplier if tramp load exceeds baseline
Verification	Annual gauss certification by OEM/third-party; quarterly maintenance strength check; monthly tramp-trend review
Records	Magnet inspection log MG-01, gauss certification, tramp-metal log

CCP-09P — Filter Screen Integrity (Liquid Egg)

Parameter	Specification
CCP ID	CCP-09P (Physical)
Process Step	In-line 100-mesh polish screen before pasteurizer balance tank
Hazard	Shell fragments, rubber gasket pieces, product clumps, plastic debris >=150 µm
Critical Limit	100-mesh (150 µm) SS screen intact — no tears, no gasket bypass — for entire run; delta-P within 5–25 psi operating band
Monitoring	Pre-op screen integrity inspection (visual + light box); continuous delta-P transmitter on PLC; post-run screen inspection after every CIP

Parameter	Specification
Corrective Action	If tear/bypass found — hold product produced since last good inspection; re-filter through certified replacement screen; investigate upstream source; retrain sanitation
Verification	Weekly dye-penetrant inspection of all screens in rotation; monthly delta-P transmitter calibration; quarterly screen inventory/lifecycle audit
Records	Screen inspection log SC-04, delta-P chart, screen change log, dye-penetrant results

CCP-10P — Metal Detector (Post-Fryer, Snack)

Parameter	Specification
CCP ID	CCP-10P (Physical)
Process Step	Metal detector between fryer discharge and seasoning drum (low-density, high-sensitivity window)
Hazard	Metal fragments from fryer screen, slicer blade chips, conveyor hardware
Critical Limit	Reject Fe >=1.5 mm, Non-Fe >=2.0 mm, SS >=2.5 mm test pieces in all 3 aperture positions; reject flap fail-safe
Monitoring	Certified test pieces at startup, every 2 hrs, post-jam, end of run; each piece confirmed in reject bin; operator + QA initial
Corrective Action	Hold since last good test; re-pass through certified backup detector, or 100% manual sort; service/recalibrate; investigate source (inspect fryer screen)
Verification	Daily QA log review; semi-annual OEM calibration; monthly reject-mechanism fail-safe test; weekly fryer-screen integrity check
Records	MD log MD-22, fryer-screen inspection log, OEM cert, reject trend chart

Temperature Control

CCP-11B — Cold Holding (RTE Bagged Salads)

Parameter	Specification
CCP ID	CCP-11B (Biological)
Process Step	Finished-goods cold storage, RTE bagged salads
Hazard	Listeria monocytogenes growth; Salmonella; Yersinia enterocolitica
Critical Limit	Product core temp <=41°F (5°C) continuous; alarm at 42°F; no excursion >45°F for >4 hrs cumulative
Monitoring	NIST-traceable continuous wireless recorder in representative product case; hourly visual gauge check; auto-alarm to on-call QA & maintenance
Corrective Action	Move product to backup cooler; evaluate cumulative T-T-T exposure — accept/rework/destroy; service refrigeration; document cumulative history on affected lots
Verification	Daily recorder vs. NIST thermometer cross-check; weekly alarm escalation test; monthly refrigeration PM; annual T-T-T challenge study
Records	Cooler chart CH-02, alarm log, PM log, T-T-T study

CCP-12B — Receiving Temperature (Raw Meat)

Parameter	Specification
CCP ID	CCP-12B (Biological)
Process Step	Receiving dock — boxed raw beef trim & poultry
Hazard	Pathogen growth in transit — Salmonella, E. coli O157:H7 & non-O157 STEC, Listeria
Critical Limit	Product internal temp <=40°F (4.4°C) on receipt; reject if >45°F; trailer air temp <=38°F at arrival; transit-logger continuous record showing no excursion >45°F
Monitoring	Calibrated probe thermometer on 3 cases per load (front/middle/rear of trailer, top/bottom of pallet); IR cross-check; download trailer logger; COA reviewed
Corrective Action	Reject load >45°F; 40–45°F window — immediately move to blast cooler, hold pending QA disposition; notify supplier & file supplier CAR; carrier reefer diagnostic requested
Verification	Daily thermometer calibration (ice bath); monthly supplier performance scorecard review; annual on-site supplier audit; quarterly CAR trend review

Parameter	Specification
Records	Receiving log RCV-03, trailer logger files, supplier COAs, rejection memos, CAR file

CCP-13B — Proofer Temperature/Humidity (Bakery)

Parameter	Specification
CCP ID	CCP-13B (Biological)
Process Step	Final proof — yeast-raised dough
Hazard	Outgrowth of Salmonella / S. aureus during extended warm dwell if proofer stalls or dough hangs up
Critical Limit	95°F ±3°F; 85% RH ±5%; maximum 90 min dwell time per rack; no rack exceeding 120 min from mix-end to oven-entry
Monitoring	Continuous proofer datalogger (temp + RH); rack in/out times stamped by barcode scanner; operator visual dough check at entry
Corrective Action	Adjust steam/HVAC; if time >120 min OR temp >104°F — destroy dough; service proofer; re-map zones
Verification	Daily sensor calibration; weekly 9-point proofer mapping; monthly trend review; annual proofer PM
Records	Proofer chart PR-05, batch dwell log, proofer mapping file

Chemical Control

CCP-14B — Acidification (Shelf-Stable Salsa)

Parameter	Specification
CCP ID	CCP-14B (Biological / Chemical — pH)
Process Step	Acidification in batch kettle — acidified foods per 21 CFR 114
Hazard	Clostridium botulinum spore outgrowth if equilibrated pH exceeds 4.6
Critical Limit	Equilibrated pH <=4.0 within 24 hrs of batch (safety margin below scheduled 4.6); acid added per filed process FDA 2541e
Monitoring	Calibrated pH meter reading on every batch post-mix; 24-hr equilibration re-check before release; operator + QA initial
Corrective Action	Add acidulant incrementally, remix, re-test; destroy if unable to reach <=4.0; investigate acid weighing, recipe card, meter calibration
Verification	Two-point pH meter calibration (pH 4.01 / 7.00) every shift; Process Authority scheduled-process letter reviewed annually; certified operator (Better Process Control School)
Records	Batch acidification log AC-01, pH calibration log, FDA 2541e on file, operator certification

CCP-15C — Sanitizer Concentration (Quaternary Ammonium)

Parameter	Specification
CCP ID	CCP-15C (Chemical)
Process Step	Final sanitizer application on food-contact surfaces (no-rinse quat)
Hazard	Under-dose -> insufficient microbial kill (biological hazard pass-through); Over-dose -> chemical residue on food-contact surface
Critical Limit	200 ppm quat (±50 ppm) per EPA label & 21 CFR 178.1010; contact time >=60 sec; water hardness within label range
Monitoring	Quat test strips at start of sanitation, every 30 min during use, and end of shift; auto-dispenser reservoir verified; titration weekly
Corrective Action	Adjust dispenser / manually dose to target; re-sanitize surfaces exposed to out-of-range solution; if over-dose on food-contact — potable water rinse and re-sanitize at label conc.; hold suspect product

Parameter	Specification
Verification	Daily titration vs. strip cross-check; monthly dispenser calibration; annual sanitizer supplier audit & water-hardness check
Records	Sanitation SSOP log, titration log, dispenser calibration log, supplier EPA label

CCP-16C — Allergen Flush / Cleaning Release (Shared Line)

Parameter	Specification
CCP ID	CCP-16C (Chemical — Allergen)
Process Step	Pre-op release after CIP/wet clean — shared-surface food-contact equipment between allergen SKUs
Hazard	Undeclared major allergen cross-contact (Big 9: milk, egg, fish, shellfish, tree nut, peanut, wheat, soy, sesame)
Critical Limit	ATP <=10 RLU at every defined swab site AND negative allergen-specific lateral flow (LOD <=5 ppm) at all sites AND visually clean — all three before line start
Monitoring	QA swabs 12 mapped sites (filler, transfer chutes, depositor, conveyor, seamer, etc.); ATP luminometer + allergen-specific LFD; supervisor signs release ticket
Corrective Action	Re-clean failed zones, re-swab; do not release line; any product run without valid release — place on hold, evaluate disposition (relabel/recall); investigate cleaning SOP & retrain
Verification	Weekly duplicate swabs by QA Manager; monthly ELISA send-out confirmation; annual full allergen cleaning validation; annual allergen refresher training
Records	Allergen release form AL-07, swab map, ATP/LFD results, ELISA reports, validation file

CCP-17B — Free Chlorine in Produce Wash Water

Parameter	Specification
CCP ID	CCP-17B (Biological / Chemical)
Process Step	Flume wash — leafy greens (cross-contamination prevention)
Hazard	Wash-water pathogen transfer (E. coli O157:H7, Salmonella, Listeria); chemical residue if over-dosed

Parameter	Specification
Critical Limit	2–5 ppm free chlorine; pH 6.5–7.5; ORP >=650 mV; continuous throughout production
Monitoring	In-line free-Cl, pH, and ORP sensors continuous to PLC; manual DPD/pH test every 30 min as cross-check; alarm auto-triggered on out-of-spec
Corrective Action	Auto-dose adjustment; if out-of-range >15 min — divert affected product to rewash; drain/replenish flume; investigate organic load (turbidity), sensor fouling; disposition product per QA
Verification	Daily DPD vs. sensor correlation; monthly sensor calibration; quarterly water-turnover & organic-load validation; annual sanitizer supplier audit
Records	Wash-water log WW-01, DPD log, sensor cal log, PLC alarm export

CCP-18C — Allergen Changeover (Nut Line to Plain Cookie)

Parameter	Specification
CCP ID	CCP-18C (Chemical — Allergen)
Process Step	Full wet-clean changeover from tree-nut cookie SKU to plain cookie SKU on shared depositor/belt/oven
Hazard	Undeclared tree nut / peanut residue on food-contact surface — cross-contact into 'free-from' SKU
Critical Limit	Post-CIP wet clean — 100% of 20 swab sites: negative allergen-specific LFD (<5 ppm), ATP <=10 RLU, visually clean; dedicated utensils staged & color-coded
Monitoring	QA performs 20-point swab map (sifters, depositor, wire cutter, belts, divider, sheeter, oven-band); release ticket required; supervisor counter-signs
Corrective Action	Re-clean failed zones, re-swab; no release until all pass; any product already run without full release — hold & evaluate for relabel as 'may contain tree nut' or recall; repeat failures escalate to Engineering for dedicated-equipment review
Verification	Quarterly ELISA confirmation on swabs; annual cleaning-validation study; annual allergen-training refresher for sanitation & QA; random audits by FSQA Director
Records	Changeover release form CO-11, 20-point swab map, LFD photos, ELISA results, validation file

Packaging Integrity

CCP-19B — Double Seam Integrity (Canning)

Parameter	Specification
CCP ID	CCP-19B (Biological — post-process recontamination)
Process Step	Double-seam closure of steel cans post-fill, pre-retort
Hazard	Post-retort recontamination (leaker spoilage / C. botulinum) through defective seam
Critical Limit	Seam overlap >=1.10 mm; tightness rating >=70%; body-hook & cover-hook per can spec; no cutovers, droops, sharp seams, vees, or false seams (21 CFR 113.60)
Monitoring	Visual external seam check every 30 min per seamer head; destructive teardown (micrometer + seam projector) every 4 hrs per head AND at startup/shutdown/jam clearance
Corrective Action	Stop seamer; adjust rolls/chuck; re-test; isolate production back to last acceptable teardown; 100% visual/leaker test on hold lot; destroy if unresolvable
Verification	Daily seam-log review by QA; annual seamer setup by OEM; biennial certified seam-inspector training (21 CFR 113.60)
Records	Seam teardown log SM-02, seam chart, seamer PM log, inspector certification

CCP-20B — Vacuum Packaging (ROP / MAP)

Parameter	Specification
CCP ID	CCP-20B (Biological — anaerobic)
Process Step	Vacuum chamber packaging of refrigerated RTE sliced deli meat
Hazard	Growth of C. botulinum (psychrotrophic type E) in anaerobic pouch if vacuum/seal inadequate combined with temp abuse; post-pack L. monocytogenes through seal leak
Critical Limit	>=25 inHg (>=85 kPa) vacuum; continuous seal width >=5 mm; no wrinkles, burn-through, or contamination in seal area; seal bar temp 320–360°F
Monitoring	In-line vacuum transducer every cycle; visual seal inspection every 15 min; methylene-blue dye leak test on 3 pouches/hr; burst strength every 2 hrs
Corrective Action	Adjust vacuum/seal parameters; hold production back to last good verification; repack failed units; service vacuum pump & replace seal bars/Teflon tape as needed

Parameter	Specification
Verification	Daily vacuum-gauge calibration; weekly burst-strength study; monthly pump PM; annual packaging validation with film supplier
Records	Vacuum log VP-04, seal inspection log, dye/burst test log, pump PM log