Investment Proposal: Semi :Automated fresh noodle production and Retail Expansion

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YB GOOD TRADING PLC, a leading fresh noodle supplier in Addis Ababa and Hawassa, proposes to expand its noodle production capacity from 1,800 kg/day to 3,000 kg/day through semi-automation and process optimization. This expansion will target both fasting (alkaline) and non-fasting (egg) noodles, packaged in retail-ready formats for supermarkets, restaurants, and direct-to-consumer sales. The project involves modern equipment, including spiral vacuum mixers, double-stage rollers, inline cutters, conveyors, boilers, cooling systems, and MAP packaging machines, ensuring improved efficiency, consistent quality, and food safety compliance.

YB GOOD TRADING PLC

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OCT,2025

Table of Contents

Executive Summary

Proposal Title: *Noodle Production Expansion and Semi-Automation proposal – YB GOOD TRADING PLC*

Proposal Overview:

YB GOOD TRADING PLC, a successful fresh noodle supplier to multiple restaurant locations in Addis Ababa and Hawassa, is undertaking a strategic expansion to scale its production capacity and enter the retail market. The company currently produces approximately **1,800 kg of fresh noodles per day** using manual and semi-manual processes. Rising customer demand, both from our restaurants and local retail outlets, presents a significant growth opportunity.

The expansion project aims to **increase production to 3,000 kg/day** through the introduction of semi-automated equipment, process optimization, and enhanced packaging systems. This initiative will enable YB GOOD TRADING PLC to supply high-quality, locally-produced noodles to supermarkets, restaurants, and direct-to-consumer channels while maintaining product quality, freshness, and affordability.

Product Portfolio:

- **Fasting (Alkaline) Noodles:** Made from wheat flour, water, alkaline solution, baking soda, and salt.
- **Non-Fasting (Egg) Noodles:** Made from wheat flour, eggs, and water.

Both product lines will be produced using **food-grade materials and processes**, with packaging optimized for shelf stability and retail readiness (250g and 500g packs).

Strategic Objectives:

1. Expand daily production capacity from 1,800 kg to 3,000 kg.
2. Develop retail-ready noodle products with standardized packaging and clear labeling.
3. Ensure compliance with food safety and HACCP standards.
4. Establish a distribution network covering retail shops, supermarkets, restaurants, and online channels.
5. Enhance brand recognition and customer loyalty.
6. Achieve sustainable financial growth with an attractive return on investment.

Technical Highlights:

- Semi-automated noodle production line from dough mixing to molding, boiling, cooling, and packaging.
- Use of industry-standard equipment such as spiral vacuum mixers, double-stage rollers, inline rotary cutters, PU flat-belt conveyors, MAP tray sealers, and modern noodle boilers.
- PLC-based control system with HMI touchscreen interface for real-time monitoring and process optimization.
- Upgraded cooling and packaging systems to eliminate current bottlenecks, ensuring smooth production flow.

Market Opportunity:

The urban demand for convenient, affordable, and locally-produced noodles is growing. Consumers already familiar with YB GOOD TRADING PLC's restaurant-quality noodles are expected to adopt the retail products quickly. The proposed expansion positions the company to capitalize on this demand while creating additional employment opportunities and strengthening its market presence.

Risk Management:

- Preventive maintenance programs to minimize machine downtime.
- Supplier agreements to mitigate raw material price fluctuations.
- Cross-training of staff to ensure operational flexibility.
- Regular audits and HACCP compliance to maintain food safety standards.

Conclusion:

The proposed expansion of YB GOOD TRADING PLC's fresh noodle production line is a strategically sound and financially attractive investment opportunity. By combining semi-automation, process optimization, and a clear retail strategy, the company is positioned to increase revenue**,** improve operational efficiency, and establish a strong foothold in the growing local noodle market**.**

Introduction

This proposal outlines a comprehensive plan to scale up the current small-scale noodle production operation of **YB GOOD TRADING PLC** to meet increasing demand and enhance production efficiency. Our noodle business, currently operating at limited capacity, has experienced consistent growth in customer demand, both from our own restaurants and external clients.

By investing in improved machinery, optimizing production workflows, and enhancing packaging capabilities, we aim to increase production output while maintaining the high quality and affordability of our noodles. This expansion is vital for tapping into new markets, reducing per-unit costs, and creating employment opportunities within the local community.

The demand for convenient, affordable, and locally-produced food products is growing, particularly in urban areas where quick meal solutions are increasingly favored. Noodles, a staple in many households and a popular fast-food option, have seen steady consumption growth across diverse market segments.

For the past eight years, **YB GOOD TRADING PLC** has successfully supplied fresh noodles to its restaurants located across Addis Ababa—including Bole Medihanialem, Airport, Friendship, Bulbula, Sarbet, Abinet, Lebu, CMC, and Olympia—as well as to the new regional branch in Hawassa. Currently, production relies heavily on manual labor and equipment, allowing the company to produce approximately **1,800 kilograms of noodles per day**. While this setup has supported loyal customer demand and ensured consistent quality, it is insufficient for large-scale commercial distribution.

To seize the growing market opportunity, we propose upgrading our production facilities, introducing more efficient machinery, improving packaging and shelf-life standards, and obtaining necessary certifications for commercial sale. Through this scale-up initiative, **YB GOOD TRADING PLC** will supply high-quality, locally-made noodles to consumers across ETHIOPIA, leveraging the brand recognition and trust already established through our restaurants. This expansion will diversify revenue streams, increase operational efficiency, and create employment, while offering an affordable, quality product to a wider market.

Background

Noodles are food products typically made from unleavened dough, which is rolled flat and cut, stretched, or extruded into long strips or strings. They are a staple in many cultures and exist in a variety of shapes and compositions.

The most commonly known noodles stem from either **Chinese or Italian cuisine**. Italian noodles, commonly referred to as pasta, differ in ingredients and preparation methods, while Chinese noodles vary widely and are identified by multiple regional names. Some Chinese foods labeled as “noodles” in English may not be dough-based but serve similar culinary purposes.

Traditional Noodle-Making

In regions like **Dalian, Liaoning, China**, traditional noodles are hand-pulled to create uniform strands. This labor-intensive method preserves texture and quality, though it limits production scale.

Etymology of "Noodle"

The English word *noodle* was borrowed in the 18th century from the German word *Nudel*, likely derived from *Knödel* or *Nutel*, referring primarily to dumplings made from wheat. Colloquial uses of "noodle" to refer to a person's head or to a "dummy" are unrelated and stem from older English terms.

Problem Statement

While **YB GOOD TRADING PLC** has successfully produced noodles for its own restaurants, the current production setup is limited in scale and designed exclusively for internal use. As interest grows from customers and local retailers, the business is unable to meet external demand with existing equipment and processes.

Key limitations include:

1. **Production Capacity** – Current manual and semi-manual equipment produces approximately 1,800 kg per day, sufficient for in-house restaurant demand but insufficient for larger-scale retail or wholesale distribution.
2. **Packaging Constraints** – Present operations rely on manual packaging in crates, which is not standardized or shelf-stable, limiting the ability to sell noodles in supermarkets or through direct-to-consumer channels.
3. **Process Bottlenecks** – Certain steps, including rolling, cutting, cooling, and packing, operate at lower throughput than upstream processes, creating work-in-progress (WIP) accumulation and inefficiencies.
4. **Food Safety & Compliance** – Current operations meet restaurant hygiene standards but are not fully certified for commercial food manufacturing, limiting distribution opportunities.

These constraints prevent the business from capitalizing on a clear market opportunity and expanding its revenue streams beyond the restaurant sector.

Market Opportunity

The local market demonstrates a growing demand for **high-quality, locally-produced noodles**. Customers who enjoy our noodles in restaurants are likely to purchase them for home consumption, and local retailers have shown interest in stocking our products.

Factors driving this demand include:

- **Convenience** – Urban consumers increasingly seek quick, easy-to-prepare meals.
- **Affordability** – Locally produced noodles offer competitive pricing compared to imported brands.
- **Quality & Brand Trust** – The established reputation of **YB GOOD TRADING PLC** in restaurants builds consumer confidence.
- **Retail Expansion Potential** – Supermarkets, grocery stores, and online delivery platforms provide channels for broader distribution.

Currently, the noodle production system is effective for internal use but **lacks capacity, packaging, and distribution systems** required for a broader market. By investing in equipment upgrades and expanding production, **YB GOOD TRADING PLC** can:

- **Increase Revenue** – Tap into new retail and wholesale channels.
- **Strengthen Brand Presence** – Build recognition beyond the restaurant business.
- **Create Employment Opportunities** – Expand staff for production, packaging, and distribution.
- **Meet Unmet Market Demand** – Supply noodles to consumers who already trust the product.

Objectives

The proposed scale-up of **YB GOOD TRADING PLC's** noodle production operation is guided by six primary objectives, each designed to ensure growth, operational efficiency, and market competitiveness.

Objective 1: Expand Production Capacity

- **Goal:** Increase daily noodle output to meet growing retail and wholesale demand.
- **Approach:**
  - Invest in suitable machinery such as dough mixers, dough rollers, noodle cutters/molders, and conveyors to streamline production.
  - Optimize workflow to reduce bottlenecks in rolling, cutting, and packing.
  - Gradually scale production while monitoring machine utilization to maintain efficiency.

Objective 2: Develop Retail-Ready Noodle Products

- **Goal:** Prepare noodles suitable for sale in supermarkets, grocery stores, and direct-to-consumer channels.
- **Approach:**
  - Standardize portion sizes (e.g., 250 g and 500 g packs).
  - Package noodles in **food-grade, branded containers** with labeling that includes ingredients, expiration date, and cooking instructions.
  - Ensure packaging supports extended shelf life while preserving noodle quality and texture.

Objective 3: Ensure Food Safety and Regulatory Compliance

- **Goal:** Achieve compliance with local and international food safety standards.
- **Approach:**
  - Register with relevant food authorities and obtain necessary licenses for food manufacturing and distribution.
  - Implement basic food safety systems, including hygiene protocols, batch tracking, and temperature control.
  - Align production with **HACCP guidelines** to minimize risk and ensure consistent quality.

Objective 4: Build Distribution Channels in the Local Market

- **Goal:** Expand the reach of noodles beyond company-owned restaurants.
- **Approach:**
  - Establish direct-to-consumer sales through restaurants, social media, and delivery app platforms.
  - Partner with local grocery stores, supermarkets, and restaurants to distribute products.
  - Launch sample campaigns and introductory pricing to attract initial retail customers.

Objective 5: Strengthen Branding and Customer Awareness

- **Goal:** Create a recognizable, trusted noodle brand.
- **Approach:**
  - Develop branding aligned with or distinct from the existing restaurant brand.
  - Emphasize quality, freshness, and local production in marketing campaigns.
  - Promote the product via social media, in-store displays, and promotional events.

- Educate customers on product uniqueness, such as **handmade, preservative-free, and locally sourced**.

Objective 6: Develop Financial Sustainability and Scalability

- **Goal:** Ensure long-term profitability while supporting gradual growth.
- **Approach:**
  - Establish a cost-effective pricing model with healthy profit margins for wholesale and retail channels.
  - Monitor production costs, packaging expenses, and distribution logistics to maintain operational efficiency.
  - Reinvest profits into equipment upgrades and facility expansion as demand grows.

These objectives provide a **clear roadmap** for the expansion project, aligning production improvements, food safety, distribution, branding, and financial planning to achieve sustainable growth.

The next step is the **Technical Plan and Process Description**, where we detail the **fasting and non-fasting noodle production workflows**, including machines, cycle times, bottlenecks, and suggested improvements.

Technical Plan and Process Description

The technical plan for **YB GOOD TRADING PLC** focuses on scaling production capacity, ensuring consistent product quality, optimizing workflows, and preparing noodles for retail distribution. The plan covers **fasting (alkaline) noodles** and **non-fasting (egg) noodles**, detailing each process step, machine specifications, cycle times, and improvement recommendations.

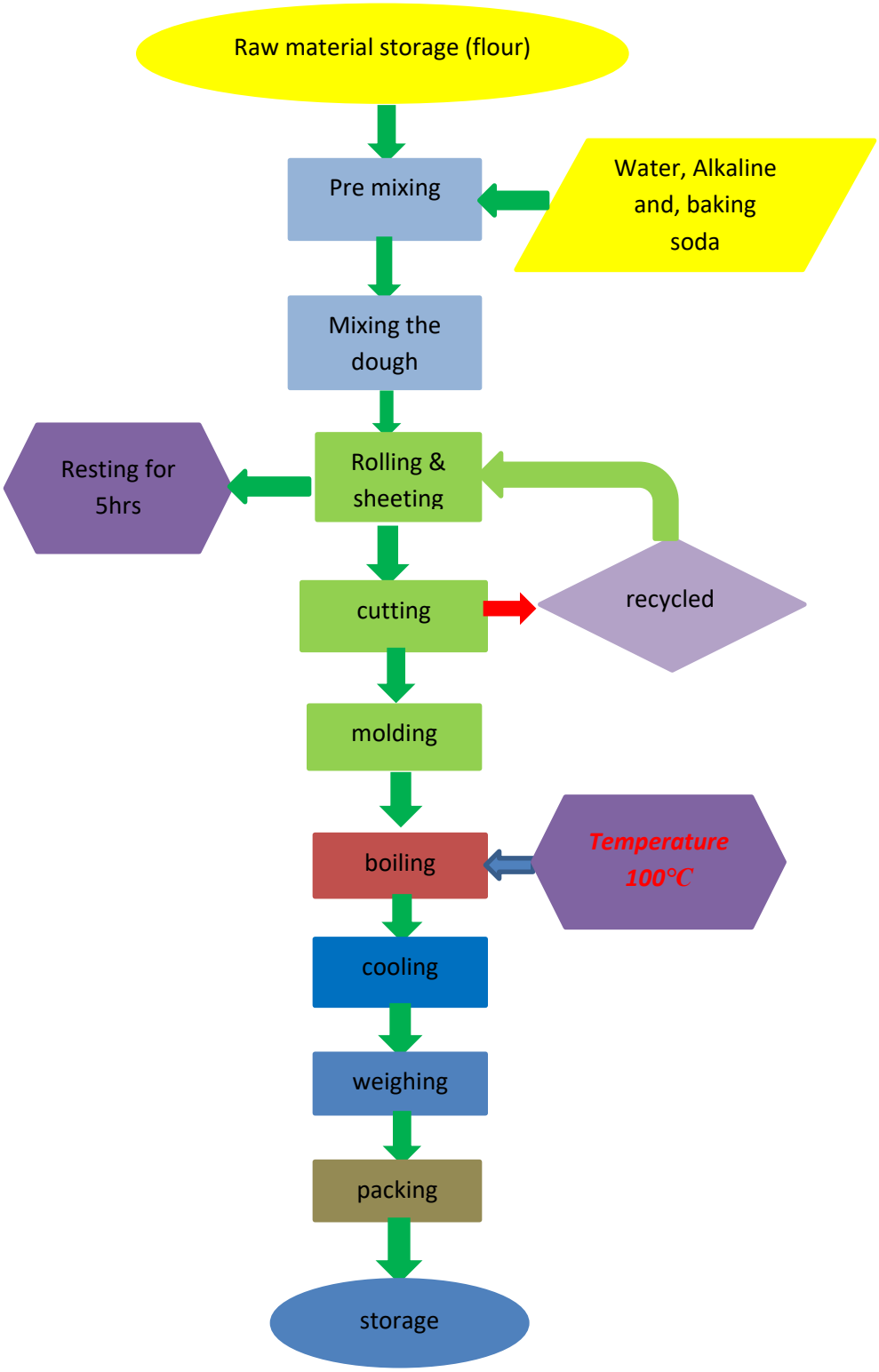
1. Types of Noodles Produced

1.1 Fasting Noodles (Alkaline Noodles)

- **Ingredients:** Wheat flour, water, alkaline solution, baking soda, salt
- **Process Summary:**
  1. Raw materials are manually pre-mixed to form initial dough.
  2. Dough is further mixed in a spiral mixer for consistency.
  3. Rolled and sheeted until smooth and uniform.
  4. Rested for 5 hours to enhance texture.
  5. Cut manually into desired size for molding.
  6. Shaped using a molding machine.

7. Boiled at approximately 100°C for 5–7 minutes.
8. Cooled immediately in cold water.
9. Weighed and packed into packaging crates.
10. Stored temporarily before distribution.

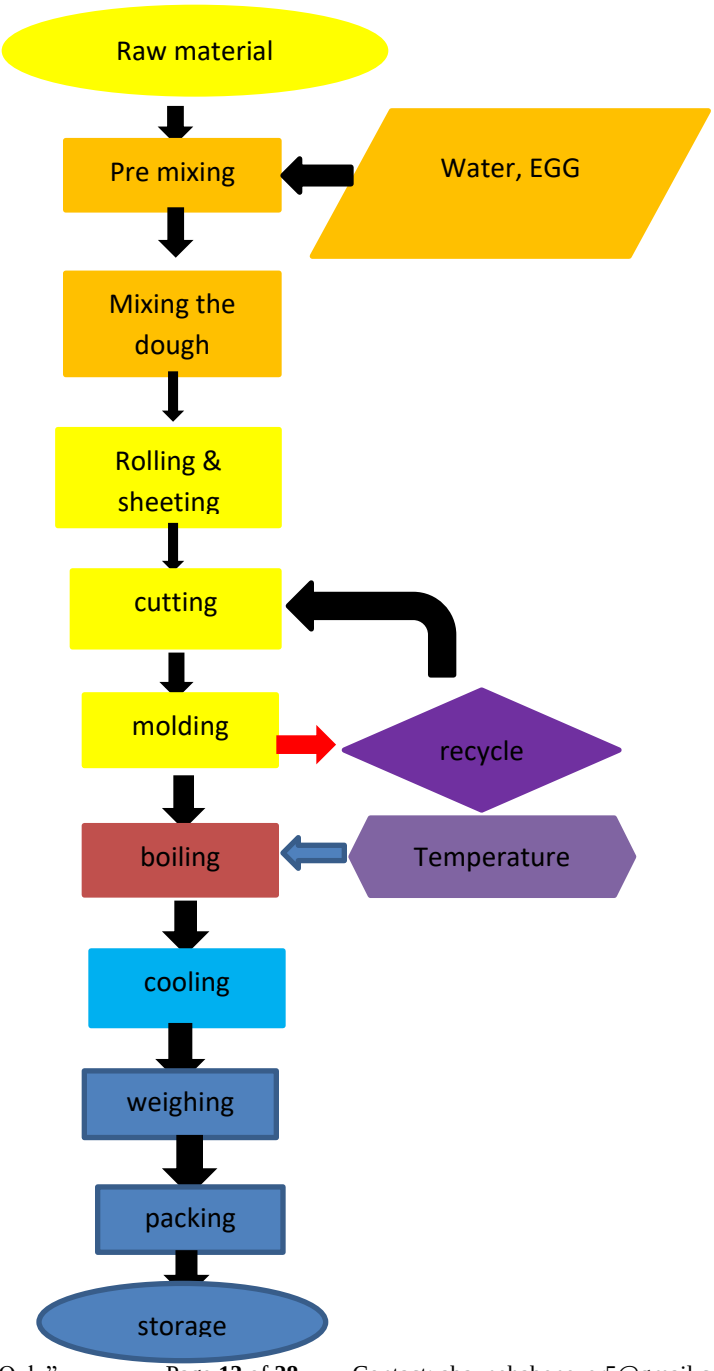
FLOW CHART OF THE FASTING NOODLE PRODUCTION PROCESS



1.2 Non-Fasting Noodles (Egg Noodles)

- **Ingredients:** Wheat flour, eggs, water
- **Process Summary:**
    1. Ingredients are mixed in a spiral mixer until smooth.
    2. Dough is sheeted and rolled without resting.
    3. Cut into desired noodle shapes using a molding machine.
    4. Boiled at 100°C for 5–7 minutes.
    5. Cooled in cold water.
    6. Weighed and packed into crates.

FLOW CHART OF THE NON FASTING NOODLE PRODUCTION PROCESS



2. Detailed Process Steps (Fasting Noodles)

Process Step	Output/hr	Cycle Time (min)	Machine Used	WIP Build-Up	Utilization (%)
Mixing	120	12.5	Spiral Mixer (KPH 130 & HS60)	No	66.7
Rolling & Sheeting	100	15	3 Dough Rollers (1 faulty)	No	66.7
Cutting	100	15	Manual Cutter	No	66.7
Molding	208	1	2 Molders	Yes	66.7
Boiling	455.4	5	3 Pots + 1 Preheat Pot	Yes	66.7
Cooling	Based on boiled amount	–	Manual Cold Water	–	66.7
Packing	Based on cooled amount	–	Manual Crate Packing	–	66.7

Note on Utilization:
Utilization indicates the proportion of time a machine is actively producing relative to its total available time. Current average utilization is 66.7%, showing potential for efficiency improvement.

3. Bottleneck Identification

Current bottlenecks:

- **Rolling & Sheeting (100 units/hr)**
- **Cutting (100 units/hr)**

Although mixing is slightly faster (120 units/hr), improving rolling and cutting will shift the next bottleneck upstream if not addressed.

4. Recommendations for Improvement

4.1 Rolling & Sheeting

- Repair or replace the faulty roller shaft.
- Expected output increase to ~150 units/hr after fixing.

4.2 Cutting

- Introduce semi-automated or mechanical cutters to increase speed.
- Consider ergonomics and labor training for manual handling if automation is delayed.

4.3 Mixing

- Monitor after upstream improvements; potential next bottleneck.
- Reduce cycle time via optimized batch planning or parallel mixers.

4.4 Line Balancing

- After equipment upgrades, reassess line speed.
- Ensure cooling and packing steps can handle increased output to prevent new bottlenecks.

5. Cooling and Packing Optimization

Process Step	Output/hr	Notes	Utilization (%)
Cooling	Based on boiled output (~455 units/hr)	Manual cold water	66.7
Packing	Based on cooled output	Manual crate	66.7

Suggested Improvements

- **Cooling:** Install automated cooling tunnels or conveyor systems; increase capacity; implement continuous flow.
- **Packing:** Introduce semi-automated tray sealers; optimize workflow; standardize packaging; add staff or shifts if automation is not feasible.

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6. Future Semi-Automated System Design

- **Section 1 (Dough Feeder → Molding):** Semi-automated, food-grade belts and conveyors.
- **Section 2 (Boiling → Packing):** Semi-automated to handle higher throughput.
- **Mixing:** Maintained as batch processing (spiral + vacuum mixers optional for premium noodles).

Benefits of Semi-Automation:

1. Increase production capacity and throughput.
2. Reduce bottlenecks in cooling and packing.
3. Improve product quality and consistency.
4. Enhance food safety and hygiene.
5. Reduce labor dependency and fatigue.
6. Minimize product waste.
7. Support business growth and scalability.
8. Improve operational efficiency.
9. Better utilize upstream equipment capacity.
10. Ensure faster ROI on equipment investment.

Equipment Requirements & Specifications

To scale production efficiently and maintain product quality, **YB GOOD TRADING PLC** requires a combination of semi-automated and food-grade machinery. Equipment has been selected based on current production capacity (50 kg batches) and projected growth for retail distribution.

1. Mixing Equipment

Equipment	Type / Brand	Capacity	Features	Estimated Price (USD)
Vacuum Spiral Mixer	Famag IM-50 (Optional Vacuum)	50 kg/batch	European build, improves dough texture	$6,000 – $18,000
Vacuum Spiral Mixer	Diosna SP/VAC	50 kg/batch	Premium industrial, built-in vacuum	$20,000+
Vacuum Spiral Mixer	Chinese OEM	50 kg/batch	Budget-friendly, PLC control	$2,000 – $9,000

Notes:

- Recommended for semi-automated 50 kg batches: Standard Spiral Mixer or optional vacuum for premium noodles.

2.Dough feeder

Option	Capacity (kg/batch	Screw Diameter (mm	Hopper Capacity (kg	Features	Estimated Price (USD)
Option 1 – Basic	30–50	100	50	Manual speed adjustment, standard stainless steel, easy-clean	3,000–4,000
Option 2 – Standard	50–70	120	75	Variable speed motor, polished SS, quick-release hopper, easy integration with roller	5,000–6,500

3. **Dough Roller / Sheeter**

Option	Capacity	Features	Integration	Estimated Price (USD)
Basic Double Roller	80–100 kg/hr	Manual thickness adjustment	Standalone	$3,500 – $4,500
Standard Double Roller (Recommended)	100–150 kg/hr	Motorized thickness control, stainless frame	Sync with feeder & cutter	$5,500 – $7,000
Premium Servo-Control Roller	150–250 kg/hr	Servo motors, auto scrap return	Full PLC integration	$9,000 – $12,000

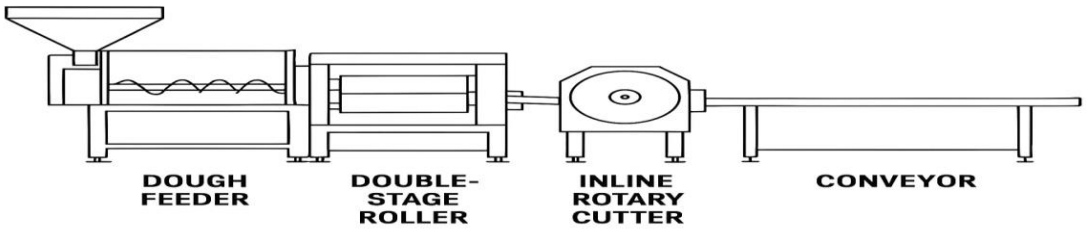
4. Noodle Cutter / Molder

Option	Capacity	Cutting Mechanism	Features	Estimated Price (USD)
Basic Rotary Cutter	80–100 kg/hr	Rotary drum, fixed blades	Manual speed match	$2,500 – $3,500
Standard Rotary Molding Unit (Recommended)	120–150 kg/hr	Rotary cutter, interchangeable mold rollers	Hygienic, optional scrap return	$4,500 – $6,000
Premium Servo Rotary Molder	180–250 kg/hr	Servo-driven, multi-cut molds	PLC sync, auto scrap return	$7,500 – $10,000

4. Conveyor System

Equipment	Capacity	Features	Integration	Estimated Price (USD)
Standard PU Flat-Belt Conveyor	Matches line speed	350–400 mm belt width, food-grade PU, VFD	PLC / encoder input	$2,200 – $4,000

Notes: Ensures smooth transfer from feeder → roller → cutter → boiling, minimizing WIP buildup



5. Boiling Equipment

Model	Capacity	Features	Approx. Price (USD)
LOYALHEARTDY 6 Basket Noodle Boiler	6 baskets	Electric, adjustable temp, stainless steel	$1,200
Pre Asion 6KW Commercial Pasta Cooker	6 baskets	Multifunctional, temp control	$1,500
Chanda 6-Burner Electric Noodle Boiler	6 baskets	Auto lift, smart cooker	$1,800
Jieguan GH-788 12-Basket Gas Noodle Boiler (Recommended)	12 baskets	Multi-basket, fast heating, stainless	$3,500 – $4,500

6. Cooling Equipment

Method	Capacity	Features	Approx. Price (USD)
Air Cooling Conveyor	50–200 kg/hr	Adjustable airflow, stainless, CE certified	$1,500 – $3,000
Water Cooling Tank	100–500 kg/batch	Filtration, stainless steel	$1,000 – $2,500
Spiral Air Cooler	150–1,000 kg/hr	Multi-layer design, PLC control	$10,000 – $20,000
CAC O 500/1700 Air Cooling Conveyor (Recommended)	Matches line speed	Intensive cooling for high-volume output	$3,500 – $5,000

7. Packaging Equipment (MAP Tray Sealer)

Option	Capacity	Features	Suitable For	Approx. Price (USD)
Bench / Tabletop MAP Sealer	10–20 trays/min	Gas flush only, manual	Small batches / trial	$180 – $300
Entry-Level Semi-Auto MAP Sealer	20–40 trays/min	Vacuum + gas flush	Small commercial line	$1,500 – $2,500
Mid-Range Semi-Auto MAP Tray Sealer	40–60 trays/min	Stainless steel, changeable mold	Semi-automated line	$4,000 – $6,000
Automatic MAP Tray Sealer	60–100 trays/min	PLC, inline feeding, date print	Higher production / retail	$8,000 – $15,000
High-Speed MAP Line	100–200 trays/min	Full automation, labeling	Industrial / export	$20,000+

Recommended: Mid-range or automatic MAP sealer for semi-automated line to match production capacity.

8. Food-Grade Materials

Section	Equipment/Contact Surface	Recommended Material	Why Suitable
Mixing / Dough Contact	Mixer bowl, spiral arm	Stainless Steel 304 / 316	Corrosion-resistant, hygienic
Feeding / Hopper	Raw dough contact	SS304 with PTFE lining	Prevents sticking
Rolling & Sheeting	Roller barrels, frames	SS304 / 316	Smooth, rust-resistant
Conveyor Belts	Raw dough to boiling	PU or modular PP, food-grade	Heat-resistant, FDA-approved
Cutting / Molding	Blades & surfaces	SS304 / 316	Hygienic, corrosion-resistant
Boiling Baskets / Tank	Interior mesh	SS316	Corrosion-resistant in hot water
Cooling Conveyor	Belt surface	Food-grade PU / PP	Resistant to moisture
Packaging Table / Tray	Work table, guides	SS304	Easy to sanitize
MAP Tray / Film	Heat sealing plates	Anodized aluminum / SS304	Clean sealing, hygienic

Control System & Automation

The control system is essential for **coordinating the production line**, maintaining consistent quality, and reducing manual errors. It integrates the **dough feeder, roller, cutter/molder, conveyors, boiling, cooling, and packaging units** into a semi-automated system.

1.Programmable Logic Controller (PLC)

Component	Function / Role
PLC Unit	Central processing unit that executes pre-programmed instructions and coordinates all machines. Ensures line synchronization, monitors output, and triggers alarms for errors.
Touchscreen HMI	Human-Machine Interface for operators to monitor real-time parameters, adjust settings, and respond to alerts. User-friendly graphical interface.
Sensors	Track critical production parameters such as dough thickness, roller speed, belt motion, and temperature of boiling/cooling lines.
Actuators	Control motor speeds, conveyor belts, cutting/molding actions, and automated lifting or batching mechanisms.

2. Dough Feeder & Roller Integration

- **Dough Feeder:** Receives pre-mixed dough and delivers it consistently to the roller.
  - Adjustable feed rate synced with roller speed.
  - Food-grade stainless steel construction.
- **Double-Stage Roller / Sheeter:**
  - Integrated with feeder and cutter via PLC.
  - Automatic thickness control using sensors.
  - Ensures smooth, uniform dough sheet output.

3. Cutter / Molder Automation

- **Inline Rotary Cutter / Molder:**
  - Receives dough sheet directly from roller.
  - Servo-driven or VFD-controlled for precise cutting speed.
  - Interchangeable molds for different noodle shapes.
  - Optional scrap return system.
- **Synchronization:** PLC ensures roller output matches cutter speed to avoid jams or overproduction.

4. Conveyor System

- **PU / Modular Food-Grade Belts:** Move dough sheets or noodles between machines.
- **Adjustable Speed:** Controlled via PLC to match upstream and downstream capacities.
- **Sensors:** Detect noodle presence to prevent bottlenecks or spillage.
- **Optional Features:** Side rails, transfer tables, and quick-release belts for hygiene and easy cleaning.

5. Boiling, Cooling, and Packaging Control

Stage	Automation & Control Features
Boiling	Temperature sensors, basket lift control, timers, alarm system for under/overcooking.
Cooling	Conveyor-based cooling system with airflow or water circulation sensors. Temperature control via PLC ensures proper noodle texture.
Packaging (MAP Sealer)	PLC-controlled tray feeding, vacuum & gas flush cycles, sealing temperature, and conveyor speed. Integrated labeling and date printing optional.

6. Benefits of the Integrated Control System

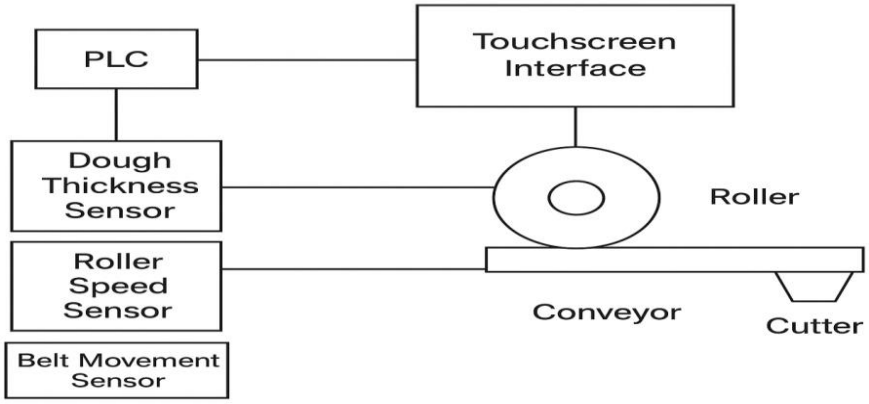
1. **Consistency:** Precise control ensures uniform noodle thickness, shape, and texture.
2. **Efficiency:** Synchronizes machines to reduce downtime and WIP buildup.
3. **Food Safety & Hygiene:** Minimizes manual contact, ensuring compliance with standards.

4. **Scalability:** Easily adjustable for batch size increase or additional production lines.
5. **Monitoring & Reporting:** Real-time production data helps with troubleshooting, maintenance scheduling, and quality control.
6. **Reduced Labor Dependency:** Operators can monitor and adjust the line rather than manually performing each step.

7. Suggested PLC & Automation Components

Component	Specification / Purpose	Approx. Price (USD)
PLC Controller	16–32 I/O, expandable for line integration	$800 – $1,500
HMI Touchscreen	7–10 inch, graphical display	$400 – $800
Dough Thickness Sensor	Measures roller sheet thickness	$200 – $400
Conveyor Speed Sensor	Monitors belt speed & synchronizes line	$150 – $300
Temperature Sensors	Boiling and cooling monitoring	$100 – $250
VFD Motor Drives	Variable frequency drives for motors	$500 – $1,200
Actuators / Solenoids	For lifting, batching, and automated operations	$300 – $600

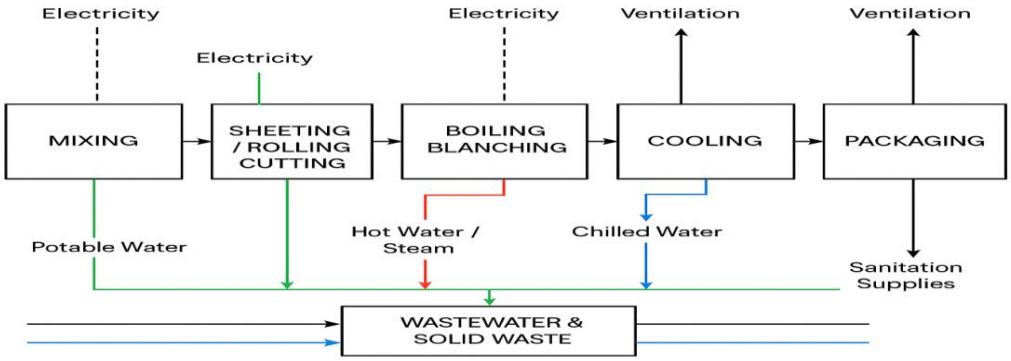
This **Control System & Automation** plan ensures that your **semi-automated noodle line** operates efficiently, maintains consistent product quality, and is scalable for future expansion to retail, supermarkets, and direct-to-consumer channels.



UTILITIES

Utilities Required for Fresh Noodle Production (Mixing → Packaging)

Utility	Purpose / Use	Specification / Requirement	Approx. Consumption / Notes
Electricity	Powers mixers, rollers, sheeters, cutters, conveyors, boilers, cooling units, and packaging machines	380–415 V, 3-phase; industrial supply; overload protection; optional UPS for critical machines	~50–100 kW depending on line capacity
Potable Water	Dough hydration, cleaning of equipment, noodle boiling, and cooling water	Filtered/softened; sufficient flow for consistent dough quality	~500–1000 L/hr; depends on batch size and boiler/cooling water needs
Steam / Hot Water	Noodle boiling or blanching (if using steam-heated boiler)	Temperature control: 95–100°C; insulated piping; safety valves	~200–400 kg/hr steam for medium-scale line; or equivalent hot water
Compressed Air	Pneumatic gates, actuators, packaging automation, and cleaning	6–8 bar; moisture-free with air dryer; reservoir tank	~50–100 L/min; line-specific usage
Cooling / Chilled Water	Rapid cooling of boiled noodles to maintainquality	Temperature: 5–10°C; chiller or cold water circulation; cooling tunnel or bath	~1–2 m³/hr depending on noodle throughput
Wastewater Drainage	Disposal of cleaning water, residual dough, and wash water	Connected to municipal sewer or treatment tank; solid waste bins	Flow depends on cleaning cycles; estimated 500–1000 L/day
Ventilation / Exhaust	Remove heat, steam, and odors; maintain hygiene and worker comfort	Industrial exhaust hoods over boiling/packaging; sufficient air circulation	≥10–15 air changes/hour for production area
Cleaning / Sanitation Supplies	Maintain hygiene of all equipment and surfaces	Hot water, detergents, sanitizers; CIP system or manual cleaning	Water: ~200–400 L/day; chemical consumption per manufacturer recommendation



MAN POWER PLAN

Section	Role / Position	Staff per Shift	Total Staff (3 Shifts)	Responsibilities
Raw Material / Mixing	Mixer/Material Operator	1	3	Mix dough, handle ingredients, minor cleaning
Sheeting / Rolling	Roller/Cutter Operator	1	3	Operate rollers and inline cutter, ensure dough & noodle size
Boiling / Cooling	Boiling/Cooling Operator	1	3	Operate boiling & cooling line, monitor temp & time
Maintenance / Utilities	Maintenance Technician	1 (shared, on-call)	1–2	Preventive checks, handle breakdowns
Supervision / Admin	Production Supervisor	1 (rotating)	3	Oversee production, manage safety & staff

SWOT ANALYSIS

SWOT	Details
Strengths	- Established customer base and branch restaurant market- Experienced production team- High-quality, fresh noodles- Streamlined operations from mixing to packaging- Scalable production capacity
Weaknesses	- High initial investment for machinery- Limited workforce for expanded operations- Dependence on raw material suppliers- Need for technical expertise for new equipment
Opportunities	- Growing demand for fresh noodles- Potential for product diversification- Partnerships with supermarkets and restaurants- Automation can reduce labor and operational costs- Brand expansion to new regions
Threats	- Strong competition from other noodle producers- Compliance with food safety regulations- Economic fluctuations affecting costs- Equipment downtime

Implementation Plan & Summary

To scale **YB GOOD TRADING PLC**'s noodle production efficiently, we propose a **phased implementation plan** that upgrades machinery, integrates automation, and improves workflow while minimizing disruption to current operations.

1. Phased Implementation Plan

Phase	Equipment / Activities	Objectives	Timeline	Expected Outcome
Phase 1: Packing Improvement	Semi-Automatic MAP Tray Sealer, Automatic Bag Filling & Sealing	Relieve packing bottleneck, improve hygiene and speed	1 month	Packing capacity matches current boiling/cooling output; reduced WIP; improved product consistency
Phase 2: Cooling Upgrade	Air Cooling Conveyor or Spiral Air Cooler	Match cooling capacity with boiling and packing, ensure rapid cooling	1–2 months	Prevents overcooking, maintains noodle texture, allows continuous workflow
Phase 3: Upgrading Boiling Process	12-Basket Gas or Electric Noodle Boiler	Standardize cooking, improve safety, reduce labor	2–3 months	Increased boiling throughput; consistent noodle quality; reduced gas/electric consumption
Phase 4: Semi-Automated Line Integration	Dough Feeder, Double-Stage Roller, Inline Rotary Cutter, PU Conveyor, PLC Control System	Streamline production from dough feeding to molding	2–3 months	Reduced manual labor, balanced production line, removal of bottlenecks
Phase 5: Staff Training & Workflow Optimization	Employee training, layout improvements, hygiene protocol	Ensure smooth operation and compliance	1 month	Skilled operators, improved safety, efficient line operation
Phase 6: Monitoring & Adjustment	Line performance review, data logging, minor adjustments	Fine-tune equipment, optimize output	Ongoing	Maximize utilization, maintain consistent quality, avoid bottlenecks

Total Implementation Timeline: Approximately 6–9months

Phase	Main Equipment / Activity	Cost Estimate (USD)	Duration	Expected Output Gain
1. Factory Preparation	Building improvements, utilities installation (water, electricity, drainage, HVAC)	35,000	2 months	Ready-to-operate facility
2. Mixing & Doughing Setup	Mixers, dough rollers, kneading machines	25,000	1 month	2,500–3,000 kg/day
3. Molding & Forming Line	Molding machines, rollers, conveyors	20,000	1 month	Efficient shaping, reduced labor
4. Boiling & Cooling Line	Boilers, steam system, cooling tanks	30,000	1 month	Continuous processing, improved quality
5. Packaging Line	Packing machines, labeling, sealing	15,000	1 month	Ready-to-market packaged noodles
6. Storage & Warehousing	Raw material and finished goods racks, cold/warm storage	10,000	0.5 month	Organized inventory, minimized losses
7. Workforce Training	Staff training on operations, QA, HACCP	5,000	0.5 month	Skilled operators, reduced errors
8. Quality & Compliance Setup	HACCP system, certifications, lab setup	7,500	1 month	Compliance with EFDA & ISO standards
9. Marketing & Distribution Launch	Branding, social media, delivery setup	10,000	1 month	Market-ready product, initial sales

Total Estimated Investment: $157,500 USD
Total Duration: ~9 months

Financial Summary (Indicative)

The planned scale-up of YB GOOD TRADING PLC's noodle production is expected to **significantly increase output and operational efficiency** while laying the foundation for revenue growth

Parameter	Details / Notes
Daily Production	2,500–3,000 kg (post-upgrade)
Capital Investment	~$157,500 USD (machinery, equipment, and facility improvements)
Operating Costs	To be finalized by the finance team (includes raw materials, labor, utilities, packaging, and maintenance)
Revenue Potential	Projected increase due to higher production; actual selling price to be determined by sales & marketing team
Key Benefits	- Increased production capacity to meet retail and wholesale demand- Reduced bottlenecks in rolling, cutting, cooling, and packing- Improved product consistency and quality- Labor efficiency and scalability for future expansion- Faster ROI potential from optimized production workflow

Expected Production Capacity After Upgrade

Production Stage	Current Output (kg/day)	Post-Upgrade Output (kg/day)	Notes
Mixing	1,800	2,500–3,000	With optimized spiral mixers
Rolling & Sheeting	1,800	2,500	Faulty roller fixed; semi-automated integration
Cutting / Molding	1,800	2,500	Semi-automated rotary cutter
Boiling	1,800	2,500–3,000	Upgraded boiler ensures consistency
Cooling	1,800	2,500–3,000	Conveyor / spiral cooler matches output
Packaging	1,800	2,500–3,000	Semi-automatic MAP sealer increases speed

Estimated Increase: 40–65% in daily production, with potential further growth as market demand rises.

Certifications & Compliance

To ensure food safety and market credibility, the following certifications and compliance steps will be implemented:

Certification / Compliance	Purpose	Estimated Timeline
EFDA Registration	Legal requirement for food production and sale in Ethiopia	1–2 months
HACCP Implementation	Hazard analysis and critical control points for food safety	2–3 months
ISO 22000 (Optional)	International food safety management standard	3–6 months
Hygiene & QA System	Standard operating procedures, staff training, and sanitation protocols	1 month (ongoing)

Compliance ensures noodles meet regulatory standards, supports retail and wholesale distribution, and minimizes food safety risks.

Key Benefits of Implementation

1. **Increased Production Capacity:** Meets growing internal and external demand, including retail markets.
2. **Reduced Bottlenecks:** Fixes rolling and cutting limitations; cooling and packing are synchronized with upstream processes.
3. **Consistent Product Quality:** Semi-automation and PLC control ensure uniform noodle thickness, texture, and cooking.
4. **Food Safety & Hygiene:** Reduced human contact and improved materials prevent contamination.
5. **Labor Efficiency:** Fewer manual tasks allow staff to focus on supervision and quality assurance.
6. **Scalability:** The line can expand for higher batch sizes or additional product lines in the future.
7. **Financial Returns:** Increased output, reduced waste, and optimized labor improve profit margins.

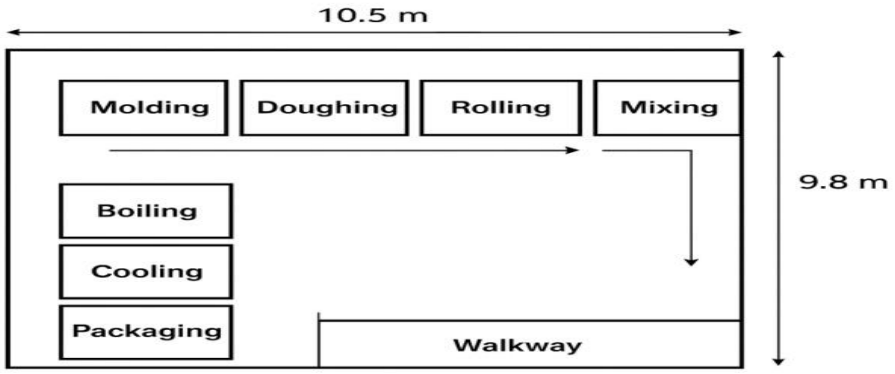
Summary

- **Objective:** Upgrade production from small-scale manual operations to a **semi-automated, scalable line** for both restaurant and retail markets.
- **Approach:** Implement in phases to minimize disruption and optimize investment.
- **Outcome:** Enhanced productivity, quality, and safety; prepared for future market expansion; strong ROI potential.
- **Next Steps:** Acquire equipment, train staff, integrate PLC control, monitor line performance, and scale production based on d

APPENDIX

A. Factory Layout Diagram

Description: Labeled schematic showing production flow:
Mixing → Doughing → Rolling → Cutting → Molding → Boiling → Cooling → Packaging → Storage



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Appendix B: Equipment and Machinery Specifications

Machine	Capacity	Power (kW)	Illustration
Vacuum Spiral Mixer	50 kg/batch	7–10	
Standard Double Roller	100–150 kg/hr	4–5	
Standard PU Flat-Belt Conveyor	Matches line speed	1–2	
Jieguan GH-788 12-Basket Gas Noodle Boiler	12 baskets	12–15	

CAC O 500/1700 Air Cooling Conveyor	Matches line speed	3–4	
Mid-Range Semi-Auto MAP Tray Sealer	40–60 trays/min	2–3	

APPENDIX C Raw Materials and Storage

Material	Storage Type	Quantity	Notes
Flour	Dry storage	2 tons	Keep away from moisture
Eggs	Refrigerated storage	15000 kg	Temperature 2–5°C
Seasonings	Dry storage	200 kg	Airtight containers
Packaging	Storage racks	1000 packs	Near packaging area for easy access

Appendix D: Safety and Compliance

- Fire extinguishers and emergency exits in all areas
- Machinery with protective guards
- Compliance with local food safety regulations
- Staff training for safety and hygiene