



महर्षि दयानंद सरस्वती स्वदेशी कंसोर्टियम

MAHARSHI DAYANAND SARASWATI SWADESHI CONSORTIUM

(A Joint Venture of MDSU and CHARGE)

BASICS OF PULSE MILLING

From Pulse to Nutrition

UNDERSTAND
Types and composition of pulses

LEARN
Milling principles and equipment

IMPROVE
Particle size and milling efficiency

ENSURE
Quality, safety and hygiene

APPLY
Knowledge for better products and nutrition

THE PULSE MILLING PROCESS

1. SELECT
Choose quality pulses

2. CLEAN
Remove impurities and dust

3. DRY
Reduce moisture to desired level

4. MILL
Grind to desired particle size

5. SIEVE
Separate and ensure uniformity

6. PACK
Store in clean, airtight packaging

WHAT YOU WILL LEARN

- ✓ Basics of pulse structure and nutrition
- ✓ Milling methods and equipment
- ✓ Factors affecting milling performance
- ✓ Quality evaluation of pulse flours
- ✓ Storage and shelf-life considerations
- ✓ Applications in food and feed products

Model Curriculum

Course Name: Basics of Pulse Milling

Course Code: MDSSC/005

Course Duration: 3 Month

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MDSU : -Maharshi Dayanand Saraswati University

CHARGE : - Choyal Hub for Agribusiness, Research, Growth, and Entrepreneurship



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Programme Overview

The Basics of Pulse Milling programme is designed to create industry-ready professionals capable of handling pulse procurement, cleaning, grading, storage, dal milling, packaging, quality control, food safety, and pulse-based entrepreneurship. The programme integrates traditional Bharatiya pulse processing practices with modern dal milling technologies and digital business tools.

The curriculum has been designed in accordance with the objectives of skill development, entrepreneurship promotion, rural industrialization, startup creation, and employment generation. It aims to develop technical competencies as well as business capabilities among learners interested in establishing pulse-based enterprises or pursuing careers in food processing industries.

The programme combines classroom learning, laboratory training, industrial exposure, and project-based learning to ensure practical competency and entrepreneurial readiness.

Pulses occupy a vital place in Indian food security, being a primary source of protein for a largely vegetarian population. Dal milling, though a traditional activity, continues to evolve with mechanization, automation and digital record-keeping, opening avenues for rural employment, women-led enterprises and agri-based startups. This programme prepares learners to participate meaningfully in this growing sector, whether as skilled operators, quality supervisors, or independent entrepreneurs.

Training Outcomes

Upon successful completion of the programme, learners shall be able to:

Technical Competencies

- Identify major pulses and their characteristics.
- Assess raw pulse quality and storage suitability.
- Conduct pulse cleaning and grading operations.
- Operate pulse (dal) milling equipment.
- Perform dal production, splitting and polishing operations.
- Apply food safety and quality management systems.
- Conduct packaging and storage operations.
- Maintain production records and documentation.

Entrepreneurial Competencies

- Prepare project reports for dal milling units.
- Estimate capital and operational requirements.
- Understand government support schemes.
- Develop pulse-based startup concepts.
- Conduct market analysis and pricing decisions.



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Digital Competencies

- Use AI tools for business operations.
- Create digital marketing campaigns.
- Manage digital payments.
- Utilize e-commerce platforms.
- Develop online sales channels.

Proposed Modules

Module	Theory	Practical	Total
Introduction to Pulse Processing Industry	10	10	20
Production Planning and Workplace Preparation	15	25	40
Pulse Science and Raw Material Management	20	20	40
Pulse Cleaning, Grading and Storage Management	20	40	60
Pulse Milling Operations	30	60	90
Quality Control and Food Safety	15	25	40
Packaging, Warehousing and Logistics	10	20	30
Entrepreneurship and MSME Development	15	15	30
AI, Digital Marketing and E-Commerce	15	15	30
Industrial Exposure and Project Work	0	60	60
Total			440

Elective Modules

Elective 1

Production of Chana Dal and Tuar Dal – Covers pre-milling treatment, dehulling, splitting and polishing operations specific to chana (Bengal gram) and tuar/arhar (pigeon pea), including handling of their distinct husk and oil-absorption characteristics.

Elective 2

Production of Moong Dal and Urad Dal – Covers milling practices for moong (green gram) and urad (black gram), including both split and whole (gota) dal production, and the milder pre-treatment these pulses typically require.

Elective 3

Value-Added Pulse Products – Covers production of dal flour, ready-to-cook pulse mixes, roasted and flavoured dal snacks, and papad, along with their packaging and shelf-life considerations.



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Elective 4

Pulse By-Product Utilization – Covers collection, grading and marketing of husk and churi (chuni) generated during dal milling, including their use as cattle feed and other value-added applications.

Unique MDSSC Components

Unlike the FICSI curriculum, the MDSSC curriculum will include:

Startup Development

Students will learn:

- Business Opportunity Identification
- Mini Dal Mill Establishment
- Pulse Processing Unit Setup
- Value-Added Pulse Product Unit Setup
- Rural Enterprise Development
- Startup Registration
- Investor Pitch Preparation

AI for Small Business

Practical use of:

- ChatGPT
- Canva
- Google Gemini
- WhatsApp Business
- AI-based Marketing

Activities:

- Creating advertisements
- Social media content
- Product descriptions
- Customer communication

Digital Commerce

Students will learn:

- UPI Business Setup
- ONDC Registration
- Digital Catalogues
- Online Customer Acquisition
- Inventory Tracking

Industrial Exposure

Visits may include:

- Dal Mills
- Pulse Warehouses/Godowns



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- Food Processing Units
- MSMEs
- Farmer Producer Organizations (FPOs)
- Pulse Markets (Mandis)

Project Work

Every student will prepare one of the following:

Option 1

Detailed Project Report (DPR) for a Mini Dal Mill

Option 2

Value-Added Pulse Product Enterprise Plan

Option 3

Pulse By-Product Utilization Proposal

Option 4

Digital Pulse Business Startup Plan

Option 5

Village Pulse Processing Cluster Model

MODULE 1- Introduction to Pulse Processing Industry

Mapped Area: Food Processing and Pulse Milling Sector

Terminal Outcomes

The learner will be able to:

- Describe the pulse processing (dal milling) industry.
- Explain the importance of pulses in the Indian economy and diet.
- Identify major pulse-processing sectors and clusters.
- Understand employment opportunities in pulse milling.
- Explain the role of entrepreneurship in the pulse-based food sector.

Theory Duration

10 Hours

Practical Duration

10 Hours

Theory – Key Learning Outcomes

The learner should be able to:

- Explain the significance of pulses in Indian agriculture and nutrition.
- Describe the structure of the Indian pulse processing industry.
- Explain the contribution of dal milling to food and nutritional security.
- Describe the pulse value chain from farm to consumer.
- Identify major pulse categories grown in India.
- Explain chana (Bengal gram) processing.



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- Explain tuar/arhar (pigeon pea) processing.
- Explain moong (green gram) processing.
- Explain urad (black gram) processing.
- Explain masoor (lentil) processing.
- Describe minor pulses such as matar, rajma and lobia.
- Explain emerging trends in pulse processing technology.
- Discuss automation and modernization in dal mills.
- Explain opportunities in rural pulse-based enterprises.
- Discuss employment opportunities in the pulse milling sector.
- Explain startup opportunities in pulse-based food processing.
- Describe the role of NAFED, mandis and pulse traders in procurement.
- Explain India's position as a global producer and consumer of pulses.
- Discuss the role of pulses in crop rotation and soil health.
- Describe the organized and unorganized segments of the dal milling industry.
- Explain government initiatives promoting pulse production and processing.
- Discuss career pathways available to graduates of this programme.

Practical – Key Learning Outcomes

The learner should be able to:

- Identify different pulse varieties.
- Classify pulses based on processing characteristics.
- Prepare a pulse industry map of the local region.
- Analyze local pulse (dal) markets.
- Identify pulse-processing enterprises in the vicinity.
- Visit a local dal mill or pulse trading unit.
- Document the pulse value chain from farmer to consumer.
- Conduct basic market surveys of dal prices.
- Present industry observations to the class.
- Prepare an industry observation report.
- Prepare a comparative chart of major pulse-growing states of India.
- List career opportunities available in the pulse processing sector.

Classroom Aids

- Whiteboard
- Marker
- LCD Projector
- Laptop
- PowerPoint Presentations
- Pulse Samples (Chana, Tuar, Moong, Urad, Masoor)
- Industry Videos
- Charts and Posters



- India Pulse Production Maps

Tools, Equipment and Other Requirements

- Sample pulse kits
- Measuring containers
- Display charts
- Computer system
- Internet connectivity

MODULE 2- Production Planning and Workplace Preparation

Terminal Outcomes

The learner will be able to:

- Plan production activities for a dal mill.
- Organize manpower and materials for pulse milling operations.
- Prepare equipment for operation.
- Implement workplace hygiene practices.
- Maintain production schedules and records.

Theory Duration

15 Hours

Practical Duration

25 Hours

Theory – Key Learning Outcomes

The learner should be able to:

Production Planning

- Explain production planning principles for a pulse mill.
- Describe workflow management in dal milling units.
- Explain production scheduling based on order and demand.
- Identify manpower requirements for each milling stage.
- Estimate raw pulse requirements for a production run.
- Explain equipment utilization planning.
- Describe production records maintained in a dal mill.
- Explain inventory planning for raw pulses and finished dal.

Workplace Organization and Maintenance

- Describe preventive maintenance of milling machinery.
- Explain workplace organization systems (5S).
- Describe housekeeping standards for a food processing unit.
- Explain the role of visual management boards in production planning.
- Describe shift handover procedures.
- Explain calibration requirements for weighing and measuring equipment.
- Discuss the importance of manpower training records.



Hygiene, Safety and Quality at the Workplace

- Explain sanitation procedures for a pulse processing unit.
- Describe standard operating procedures (SOPs).
- Explain GMP requirements applicable to pulse milling.
- Explain workplace safety requirements in dal mills.
- Explain quality assurance procedures at the workplace.

Practical – Key Learning Outcomes

The learner should be able to:

- Prepare daily production plans for a dal mill.
- Estimate raw material requirements for a batch.
- Conduct equipment inspection before startup.
- Prepare workplace sanitation checklists.
- Organize workstations for cleaning, milling and packaging.
- Perform pre-operational checks on milling machinery.
- Maintain production records and logbooks.
- Assign workforce responsibilities for a shift.
- Monitor production schedules against targets.
- Implement cleaning procedures as per SOP.
- Verify safety compliance at the workplace.
- Prepare daily production reports.
- Prepare a 5S workplace organization checklist.
- Conduct a shift handover briefing.
- Calibrate a weighing scale using standard weights.

Classroom Aids

- SOP Manuals
- Production Charts
- Projector
- Whiteboard
- Demonstration Videos

Tools, Equipment and Other Requirements

- Cleaning equipment
- PPE kits
- Production logbooks
- Inspection checklists
- Maintenance registers



MODULE 3- Pulse Science and Raw Material Management

Terminal Outcomes

The learner will be able to:

- Understand pulse grain structure and composition.
- Evaluate raw pulse quality.
- Conduct pulse sampling.
- Assess moisture and storage suitability of pulses.
- Manage raw pulse materials effectively.

Theory Duration

20 Hours

Practical Duration

20 Hours

Theory – Key Learning Outcomes

The learner should be able to:

- Explain the anatomy of a pulse seed (seed coat, cotyledon, germ).
- Describe physical properties of pulses (size, shape, hardness, colour).
- Explain chemical composition of pulses (protein, starch, fibre).
- Discuss nutritional composition and health benefits of pulses.
- Explain moisture content significance for pulse storage.
- Describe pulse maturity indicators at harvest.
- Explain common pulse defects (shriveled, discoloured, weevil-cut grains).
- Describe grading parameters for chana, tuar, moong, urad and masoor.
- Explain procurement standards followed by mandis and mills.
- Explain pulse storage behaviour and respiration.
- Discuss pulse deterioration mechanisms during storage.
- Explain pest infestation risks in stored pulses (pulse beetle/bruchid).
- Describe quality inspection methods for incoming pulse lots.
- Explain sampling procedures for pulse consignments.
- Explain BIS and FSSAI quality standards for pulses and dal.
- Explain traceability systems for raw pulse procurement.
- Discuss procurement documentation (weighment slips, quality reports).
- Explain inventory management principles for raw pulses.
- Describe classification of pulses as kharif and rabi crops.
- Explain regional pulse growing belts of India.
- Discuss the effect of variety and agro-climatic conditions on milling quality.
- Explain hydration and cooking quality parameters of pulses.
- Explain the significance of protein content in pulse quality evaluation.
- Describe common adulterants found in raw pulses and dal.
- Explain the role of seed treatment on storability of raw pulses.



Practical – Key Learning Outcomes

The learner should be able to:

- Identify different pulse varieties by physical characteristics.
- Conduct pulse sampling from a bulk lot.
- Measure moisture content of pulse samples.
- Perform visual inspection of raw pulses.
- Identify damaged, shrivelled and insect-infested grains.
- Grade pulse samples as per standard parameters.
- Calculate impurity and foreign matter percentages.
- Record quality observations in a standard format.
- Conduct storage suitability assessments of pulse lots.
- Prepare procurement and grading records.
- Conduct a hydration/soaking test on pulse samples.
- Compare cooking quality of two pulse varieties.

MODULE 4- Pulse Cleaning, Grading and Storage Management

Mapped Area: Pulse Handling and Pre-Processing Operations

Terminal Outcomes

The learner will be able to:

- Explain pulse cleaning and grading principles.
- Identify impurities and contaminants present in raw pulses.
- Operate pulse cleaning and grading equipment.
- Apply storage management practices for pulses.
- Monitor pulse quality during storage.
- Prevent storage losses caused by pests, moisture and improper handling.

Theory Duration

20 Hours

Practical Duration

40 Hours

Theory – Key Learning Outcomes

The learner should be able to:

Cleaning Operations

- Explain the importance of cleaning pulses before milling.
- Identify different types of impurities found in raw pulses.
- Describe physical contaminants such as stones, mud balls, dust and straw.
- Explain biological contaminants including insects and fungal infestation.
- Describe the working principle of pre-cleaners for pulses.
- Explain the operation of aspirators used in pulse cleaning.
- Describe the working of magnetic separators and destoners.



- Explain the operation of specific gravity separators for pulses.

Grading Operations

- Describe pulse grading principles by size and density.
- Explain grain size classification systems using sieves and screens.
- Discuss grading standards for chana, tuar, moong, urad and masoor.
- Explain the effect of grading uniformity on downstream milling efficiency.

Storage Management

- Explain moisture management during pulse storage.
- Describe pulse respiration during storage.
- Explain causes of storage losses in pulses.
- Discuss warehouse management systems for bulk pulses.
- Explain stack formation and bag storage practices.
- Describe scientific storage methods for pulses (bin, godown, silo).
- Explain pest management techniques for pulse beetle control.
- Discuss fumigation principles and precautions for pulse godowns.
- Explain warehouse sanitation practices.

Inventory and Quality Monitoring

- Describe inventory management methods for stored pulses.
- Explain FIFO and FEFO systems in pulse warehousing.
- Discuss digital inventory systems used in modern dal mills.
- Explain pulse quality monitoring during storage.
- Describe warehouse safety procedures.
- Explain periodic stock reconciliation practices.

Practical – Key Learning Outcomes

The learner should be able to:

- Identify foreign materials in pulse samples.
- Operate pulse cleaning equipment (pre-cleaner, aspirator).
- Perform pulse grading operations using sieves and graders.
- Conduct impurity analysis on cleaned pulse lots.
- Measure moisture content before storage.
- Prepare pulse bag stacks as per storage norms.
- Maintain warehouse stock records.
- Conduct warehouse inspection for pest and moisture damage.
- Identify insect (pulse beetle) infestation in stored pulses.
- Monitor storage conditions (temperature, humidity).
- Implement sanitation procedures in the storage area.
- Demonstrate pulse sampling from storage lots.
- Prepare stock registers for incoming and outgoing pulses.



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- Conduct quality assessment during storage.
- Demonstrate fumigation safety practices.

Classroom Aids

- Computer
- Projector
- PowerPoint Presentations
- Storage Management Charts
- Warehouse Layout Diagrams
- Pulse Samples
- BIS Quality Standards Manual

Tools, Equipment and Other Requirements

- Pulse Cleaner
- Aspirator
- Destoner
- Specific Gravity Separator
- Magnetic Separator
- Moisture Meter
- Storage Bins
- Warehouse Registers
- Sampling Spears
- Weighing Scale
- PPE Kits



MODULE 5- Pulse Milling Operations

Mapped Area: Dal Milling and Value-Added Pulse Production

Terminal Outcomes

The learner will be able to:

- Understand pulse (dal) milling principles.
- Operate pulse milling equipment.
- Produce dal according to specifications.
- Optimize milling efficiency and dal recovery.
- Maintain milling machinery.
- Monitor dal quality and yield.

Theory Duration

30 Hours

Practical Duration

60 Hours

Theory – Key Learning Outcomes

The learner should be able to:

Introduction to Dal Milling

- Explain the objectives of pulse (dal) milling.
- Describe the history and evolution of dal milling technology in India.
- Explain traditional chakki and ghani-based dal milling methods.
- Describe modern mechanical dal mill systems.
- Explain dal milling terminology (dehusking, splitting, polishing).

Pre-Milling Treatment

- Explain the objective of pitting/scratching the seed coat.
- Describe oil (edible oil) treatment of pulses before milling.
- Explain water conditioning/tempering operations.
- Describe sun-drying and curing of treated pulses.
- Explain the effect of pre-milling treatment on husk removal and dal recovery.

Dehusking and Splitting

- Explain the principle of dehusking (husk removal).
- Describe the working of emery roller/carborundum roller dehuskers.
- Explain under-runner disc shellers used for pulse dehusking.
- Describe the splitting operation that separates cotyledons.
- Explain factors affecting husk removal and splitting efficiency.

Polishing and Grading of Dal

- Explain the objective of dal polishing.
- Describe oil polishing and water polishing methods.
- Explain grading of dal by size using sieves and graders.



- Describe separation of whole dal, split dal and broken.
- Explain colour sorting of finished dal.

Pulse-Specific Milling Practices

- Explain milling practices for chana (Bengal gram) dal.
- Explain milling practices for tuar/arhar (pigeon pea) dal.
- Explain milling practices for moong (green gram) dal.
- Explain milling practices for urad (black gram) dal.
- Explain milling practices for masoor (lentil) dal.
- Discuss challenges specific to milling tuar and urad.
- Compare husk adherence and oil requirement across different pulse types.
- Explain why moong and masoor generally require milder pre-treatment than tuar.

By-Products and Recovery

- Explain by-products of dal milling (husk, churi/chuni, broken).
- Discuss utilization of husk and churi as cattle feed.
- Explain dal recovery percentage and its significance.
- Discuss factors affecting overall milling recovery and yield.
- Explain typical recovery ranges for major pulses milled in India.
- Discuss value addition opportunities for milling by-products.

Dal Quality Management

- Explain dal quality parameters (colour, size uniformity, splits).
- Discuss dal moisture management after milling.
- Explain dal blending practices where permitted.
- Describe common dal quality defects and their causes.
- Explain the effect of over-polishing on dal nutritional value.
- Discuss consumer preferences influencing dal quality standards in different regions.

Milling Plant Management

- Explain process flow diagrams for a dal mill.
- Describe dal mill plant layout planning.
- Explain equipment utilization and capacity planning.
- Discuss energy efficiency in dal milling operations.
- Explain preventive maintenance systems for mill machinery.
- Describe troubleshooting procedures for common mill faults.
- Explain safety precautions to be followed in dal milling plants.

Storage and Handling of Finished Dal

- Explain moisture and temperature requirements for storing finished dal.
- Describe recommended packaging-to-storage timelines to preserve freshness.
- Explain stacking and rotation practices for finished dal stocks.



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- Discuss common post-milling quality deterioration issues (rancidity, insect re-infestation).
- Explain handling precautions to minimize breakage of finished dal.

Practical – Key Learning Outcomes

The learner should be able to:

Milling Operations

- Operate a mini dal mill unit.
- Demonstrate pitting and oil/water treatment of pulses.
- Demonstrate tempering and curing of treated pulses.
- Monitor dehulling and splitting operations.
- Perform dal collection procedures after milling.
- Measure dal yield/recovery from a given batch.

Equipment Handling

- Start and shut down dal milling systems safely.
- Conduct equipment inspection before and after operation.
- Adjust roller/sheller settings for optimum dehulling.
- Monitor machine performance during a production run.
- Perform routine maintenance of milling equipment.

Product Quality Assessment

- Conduct dal quality inspection after milling.
- Measure dal size uniformity and split percentage.
- Assess dal colour and appearance.
- Record quality observations in standard formats.

Production Management

- Calculate dal recovery/extraction rates.
- Calculate milling efficiency for a batch.
- Prepare production records for a shift.
- Maintain batch-wise production records.
- Monitor and record production losses.

Safety and Maintenance

- Use PPE during dal milling operations.
- Demonstrate machine cleaning procedures.
- Conduct preventive maintenance checks.
- Report machine faults to the supervisor.
- Follow emergency shutdown procedures.

Storage and Handling

- Pack and store a sample batch of finished dal correctly.



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- Inspect stored dal samples for quality changes over time.
- Demonstrate proper stacking of finished dal bags.

Classroom Aids

- Dal Milling Process Flow Charts
- PowerPoint Presentations
- Industry Videos
- Dal Samples (Chana, Tuar, Moong, Urad, Masoor)
- Raw Pulse Samples
- Process Manuals
- Equipment Catalogues

Tools, Equipment and Other Requirements

Milling Equipment

- Mini Dal Mill
- Emery Roller Dehusker
- Under-Runner Disc Sheller
- Splitting Unit
- Dal Polisher
- Grader/Sifter
- Bucket Elevator/Conveyor

Testing Equipment

- Moisture Meter
- Digital Weighing Scale
- Test Sieves
- Sample Containers

Safety Equipment

- Safety Goggles
- Ear Protection
- Gloves
- Dust Masks
- Safety Shoes

Documentation

- Production Registers
- Maintenance Logs
- Quality Control Forms



MODULE 6- Quality Control and Food Safety

Mapped Area: Food Quality Assurance and Regulatory Compliance

Terminal Outcomes

The learner will be able to:

- Evaluate raw pulse and dal quality.
- Apply food safety principles in pulse processing.
- Conduct quality inspections at each processing stage.
- Maintain quality records.
- Implement GMP, GHP and HACCP systems.

Theory Duration

15 Hours

Practical Duration

25 Hours

Theory – Key Learning Outcomes

The learner should be able to:

Quality Parameters and Standards

- Explain quality management principles for dal milling units.
- Describe raw pulse and dal quality parameters.
- Explain dal quality standards and specifications.
- Discuss BIS specifications for pulses and dal.
- Explain FSSAI regulations applicable to pulse products.
- Explain the role of standard testing laboratories in quality certification.
- Discuss third-party certification schemes relevant to food exporters.

Food Safety Management Systems

- Describe GMP requirements for a dal mill.
- Explain GHP principles in pulse processing.
- Discuss HACCP concepts as applied to dal milling.
- Explain contamination risks (chemical, physical, biological) in dal.
- Describe allergen management in pulse processing units.
- Explain pesticide residue and aflatoxin concerns in pulses.
- Describe corrective and preventive action (CAPA) systems.

Documentation, Traceability and Audits

- Explain traceability systems for pulse products.
- Discuss food recall procedures.
- Explain sanitation requirements for pulse processing units.
- Describe quality documentation systems.
- Explain internal and external audit procedures.
- Explain the importance of retained samples in quality control.

Practical – Key Learning Outcomes



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The learner should be able to:

- Conduct raw pulse quality testing.
- Measure moisture content of pulses and dal.
- Perform dal quality checks (colour, splits, foreign matter).
- Complete quality control records.
- Conduct sanitation inspections of the processing unit.
- Demonstrate GMP practices on the shop floor.
- Prepare HACCP records for a critical control point.
- Conduct workplace hygiene audits.
- Maintain traceability records for a batch.
- Report and document quality deviations.
- Prepare a corrective action report for a quality deviation.
- Conduct a mock food safety audit of the processing unit.

Classroom Aids

- Computer
- Projector
- PowerPoint Presentations
- FSSAI/BIS Standards Manuals
- Quality Testing Kits Demonstration

Tools, Equipment and Other Requirements

- Moisture Meter
- Weighing Scale
- Sample Sieves
- Quality Control Registers
- PPE Kits

MODULE 7- Packaging, Warehousing and Logistics

Mapped Area: Post-Processing Operations and Supply Chain Management

Terminal Outcomes

The learner will be able to:

- Select suitable packaging materials for dal and pulse products.
- Apply packaging and labeling standards.
- Manage warehousing operations for finished dal.
- Maintain inventory records.
- Coordinate transportation and logistics activities.

Theory Duration

10 Hours

Practical Duration

20 Hours

Theory – Key Learning Outcomes



The learner should be able to:

Packaging Materials and Standards

- Explain the importance of packaging in dal processing.
- Describe different packaging materials used for dal and pulse products.
- Explain characteristics of HDPE, LDPE, PP, jute and laminated packaging materials.
- Discuss food-grade packaging requirements for dal.
- Explain packaging standards for retail and bulk dal packs.
- Describe labeling requirements under FSSAI regulations.
- Explain barcode and QR code applications for traceability.
- Discuss packaging defects and preventive measures.
- Explain vacuum and modified atmosphere packaging for pulse products.
- Discuss sustainable and eco-friendly packaging alternatives.
- Explain shelf-life considerations while selecting packaging material.

Warehousing and Inventory

- Explain warehousing principles for finished dal.
- Describe warehouse layout planning for a pulse mill.
- Explain stock management systems.
- Discuss inventory control methods.
- Explain FIFO and FEFO inventory practices.
- Describe warehouse safety standards.

Transportation and Logistics

- Describe transportation requirements for pulse products.
- Explain logistics management systems.
- Discuss supply chain management principles for dal products.
- Explain export packaging basics for pulses.
- Describe cold-chain and non-cold-chain logistics differences for dry food products.

Practical – Key Learning Outcomes

The learner should be able to:

- Identify suitable packaging materials for dal products.
- Demonstrate filling and sealing operations.
- Prepare product labels as per FSSAI norms.
- Maintain stock registers for finished dal.
- Conduct warehouse inspections.
- Demonstrate inventory tracking using a register/software.
- Prepare dispatch records.
- Implement warehouse safety measures.
- Record incoming and outgoing stock.
- Monitor product storage conditions.



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- Prepare a transport/dispatch checklist for an outgoing consignment.

Classroom Aids

- Packaging Samples
- Labeling Manuals
- Warehouse Layout Charts
- Inventory Software Demonstrations
- PowerPoint Presentations
- Videos on Packaging Operations

Tools, Equipment and Other Requirements

- Packaging Machine
- Heat Sealer
- Weighing Scale
- Packaging Materials
- Labels and Stickers
- Storage Racks
- Inventory Registers
- Barcode Scanner (Demonstration)

MODULE 8- Entrepreneurship and MSME Development

Mapped Area: Enterprise Creation and Business Development

Terminal Outcomes

The learner will be able to:

- Identify business opportunities in pulse processing.
- Prepare business plans and DPRs for dal mills.
- Understand MSME registration procedures.
- Access government support schemes.
- Develop sustainable pulse-based enterprises.

Theory Duration

15 Hours

Practical Duration

15 Hours

Theory – Key Learning Outcomes

The learner should be able to:

Entrepreneurship Fundamentals

- Explain entrepreneurship concepts.
- Describe characteristics of successful entrepreneurs.
- Identify pulse processing business opportunities.
- Explain mini dal mill business models.



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- Discuss value-added pulse product business opportunities (dal flour, ready-to-cook mixes).
- Explain by-product utilization enterprises (husk and churi trading).
- Describe pulse-based snack and papad manufacturing enterprises.

Registration, Compliance and Government Schemes

- Explain business registration procedures.
- Discuss Udyam Registration for MSMEs.
- Explain GST basics applicable to food processing units.
- Describe PMEGP scheme for setting up a dal mill.
- Explain Mudra Loan scheme for small enterprises.
- Discuss Startup India initiatives.
- Describe subsidy and credit-linked schemes for food processing MSMEs.

Business Planning and Finance

- Explain market research methods for dal products.
- Describe customer analysis techniques.
- Explain costing and pricing concepts for dal products.
- Discuss break-even analysis for a dal milling unit.
- Explain working capital requirements for pulse trading and milling.
- Describe project report preparation for a dal mill.
- Explain risk management in pulse-based MSMEs.
- Discuss cluster-based development models for pulse processing.
- Explain the role of FPOs in aggregating raw pulses for small millers.

Practical – Key Learning Outcomes

The learner should be able to:

- Identify local business opportunities in pulse processing.
- Conduct market surveys for dal and pulse products.
- Prepare cost estimates for a mini dal mill.
- Develop pricing strategies for dal products.
- Prepare business plans for a pulse-based enterprise.
- Prepare a DPR for a mini dal mill.
- Estimate machinery requirements and costs.
- Calculate profitability projections.
- Complete MSME (Udyam) registration exercises.
- Present startup proposals to peers/mentors.
- Prepare a break-even analysis worksheet for a dal mill.

Classroom Aids

- Business Plan Templates
- DPR Samples



- Government Scheme Brochures
- Financial Planning Worksheets
- Case Studies
- Entrepreneur Success Stories

Tools, Equipment and Other Requirements

- Computer Systems
- Internet Connectivity
- Calculator
- DPR Formats
- Project Planning Software
- Financial Worksheets

MODULE 9- AI, Digital Marketing and E-Commerce

Mapped Area: Digital Enterprise Management

Terminal Outcomes

The learner will be able to:

- Utilize AI tools for business operations.
- Develop digital marketing campaigns for dal and pulse products.
- Create online product catalogues.
- Manage e-commerce sales channels.
- Implement digital payment systems.

Theory Duration

15 Hours

Practical Duration

15 Hours

Theory – Key Learning Outcomes

The learner should be able to:

AI Tools for Business

- Explain the role of AI in a small pulse-based business.
- Describe applications of ChatGPT in MSMEs.
- Explain content creation using AI tools for dal product promotion.
- Explain the use of AI chatbots for customer queries.
- Discuss digital invoicing and bookkeeping tools for MSMEs.

Digital Marketing

- Discuss digital branding concepts for a dal mill/enterprise.
- Explain social media marketing strategies.
- Describe Facebook and Instagram marketing for food products.
- Explain WhatsApp Business applications for order-taking.
- Discuss search engine optimization basics.



- Explain digital customer engagement techniques.

E-Commerce and Digital Payments

- Describe e-commerce business models for food products.
- Explain the ONDC ecosystem for small sellers.
- Discuss Amazon and Flipkart seller onboarding.
- Explain online inventory management.
- Describe digital payment systems.
- Explain UPI and QR payment systems for retail sale of dal.
- Discuss cyber security basics for small businesses.
- Explain customer data protection.
- Describe digital analytics tools for tracking sales.

Practical – Key Learning Outcomes

The learner should be able to:

- Create AI-generated content for a dal product brand.
- Prepare social media campaigns for pulse products.
- Design product catalogues using Canva.
- Create a WhatsApp Business profile for a dal enterprise.
- Set up digital payment (UPI/QR) systems.
- Register dal products on an e-commerce platform.
- Prepare digital advertisements for pulse products.
- Analyze customer engagement metrics.
- Generate AI-based business reports.
- Demonstrate online selling of a dal product.
- Set up a simple digital invoicing/bookkeeping record for an enterprise.

Classroom Aids

- Computer Lab
- Internet Access
- Projector
- AI Tool Demonstrations
- Digital Marketing Videos
- E-Commerce Platform Demonstrations

Tools, Equipment and Other Requirements

- Computers
- Internet Connectivity
- Smartphone
- Canva Account
- ChatGPT Access
- Social Media Accounts
- Digital Payment Apps



MODULE 10- Industrial Exposure and Project Work

Mapped Area: Industry Integration and Applied Learning

Terminal Outcomes

The learner will be able to:

- Understand industrial pulse (dal) milling operations.
- Observe best industry practices.
- Apply classroom knowledge in real-life settings.
- Prepare industry reports.
- Develop a viable business proposal.

Theory Duration

0 Hours

Practical Duration

60 Hours

Practical – Key Learning Outcomes

The learner should be able to:

- Observe dal mill operations at an industrial unit.
- Observe pulse cleaning and grading systems.
- Study storage management practices for bulk pulses.
- Analyze packaging operations for finished dal.
- Record industrial workflows.
- Interact with dal mill entrepreneurs.
- Prepare industrial visit reports.
- Conduct market studies of local dal trade.
- Identify operational challenges faced by pulse millers.
- Recommend process improvements.
- Develop project proposals.
- Present business plans to peers/mentors.
- Prepare a detailed industrial visit log with photographs and observations.
- Interview a dal mill owner or operator on business challenges.
- Benchmark a visited unit's practices against classroom learning.
- Prepare a final project presentation for evaluation.

Suggested Industrial Visits

- Dal Mills
- Pulse Warehouses/Godowns
- Pulse Processing Units
- Value-Added Pulse Product Units
- Farmer Producer Organizations (FPOs)
- Pulse Markets (Mandis)
- Agro-Based MSMEs



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- Pulse Research Institutes
- Cold Storage and Warehousing Facilities

PROJECT WORK

Every learner shall complete one project from the following:

Option 1

Detailed Project Report for a Mini Dal Mill

Option 2

Value-Added Pulse Product Enterprise (Dal Flour / Ready-to-Cook Mixes)

Option 3

By-Product (Husk and Churi) Utilization Unit

Option 4

Village-Level Pulse Processing Centre

Option 5

Digital Pulse Products Marketplace

Option 6

Integrated Pulse Processing Startup

TRAINER REQUIREMENTS

Qualification	Industry Experience	Training Experience
B.Sc./B.Tech. Food Technology, Food Engineering, Agriculture, Agricultural Engineering, Pulse/Grain Processing	Minimum 3 Years	Minimum 1 Year
M.Sc./M.Tech. Food Technology, Food Engineering, Agriculture, Agricultural Engineering, Pulse/Grain Processing	Minimum 2 Years	Minimum 1 Year
10 Years and Above Experience in Dal Milling Sector	Minimum 10 Years	Minimum 1 Year

Trainer Competencies

The trainer should possess knowledge of:

- Pulse Processing Technology
- Food Safety Systems
- Dal Milling Operations
- Storage Management
- Entrepreneurship Development



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- Digital Business Operations

ASSESSOR REQUIREMENTS

Qualification	Industry Experience	Assessment Experience
B.Sc./B.Tech. Food Technology, Food Engineering, Agriculture, Agricultural Engineering	Minimum 4 Years	Minimum 1 Year
M.Sc./M.Tech. Food Technology, Food Engineering, Agriculture, Agricultural Engineering	Minimum 3 Years	Minimum 1 Year

ASSESSMENT STRATEGY

Mid-Term Assessment

- Theory Test
- Practical Assessment
- Assignments

Final Assessment

Written Examination (30%)

Assessment Components:

- Multiple Choice Questions
- True/False Questions
- Matching Questions
- Short Answer Questions

Practical Examination (40%)

Assessment Components:

- Equipment Operation
- Pulse Quality Assessment
- Dal Milling Operations
- Packaging Operations
- Food Safety Compliance

Project Work (20%)

Assessment Components:

- Project Report
- Financial Viability
- Technical Feasibility
- Presentation

Viva Voce (10%)



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Assessment Components:

- Technical Understanding
- Problem Solving Ability
- Entrepreneurial Awareness

GLOSSARY

Term	Description
Pulse Milling	Activities involved in cleaning, grading, dehusking, splitting, polishing and packaging pulses into dal
Dal	Split, dehusked form of a pulse used for cooking
Dehusking	Process of removing the outer husk/seed coat from a pulse grain
Splitting	Process of separating the two cotyledons of a pulse grain
Polishing	Process of finishing the surface of dal by oil or water polishing
Churi/Chuni	Broken by-product generated during pulse milling, used mainly as cattle feed
Pitting	Scratching of the pulse seed coat to aid oil/water penetration before milling
Tempering	Conditioning of treated pulses to loosen the husk before dehusking
GMP	Good Manufacturing Practices
GHP	Good Hygiene Practices
HACCP	Hazard Analysis and Critical Control Point
DPR	Detailed Project Report
FPO	Farmer Producer Organization
MSME	Micro, Small and Medium Enterprise
OJT	On-the-Job Training
Traceability	Ability to track product movement throughout the supply chain
Aspirator	Equipment that uses air currents to separate light impurities from pulses
Destoner	Equipment used to separate stones and heavy impurities from grain/pulse lots
Emery Roller	Abrasive roller used in a dal mill to remove husk from pulses



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Term	Description
Under-Runner Sheller	Disc-type sheller used for dehusking pulses
FSSAI	India's apex food safety regulatory authority
Udyam Registration	Government registration process for classifying and recognizing MSMEs

ACRONYMS AND ABBREVIATIONS

Acronym	Full Form
AI	Artificial Intelligence
BIS	Bureau of Indian Standards
DPR	Detailed Project Report
FEFO	First Expiry First Out
FIFO	First In First Out
FPO	Farmer Producer Organization
FSSAI	Food Safety and Standards Authority of India
GHP	Good Hygiene Practices
GMP	Good Manufacturing Practices
HACCP	Hazard Analysis and Critical Control Point
MSME	Micro, Small and Medium Enterprise
NSQF	National Skills Qualification Framework
OJT	On-the-Job Training
SOP	Standard Operating Procedure
UPI	Unified Payments Interface
ONDC	Open Network for Digital Commerce
PMEGP	Prime Minister's Employment Generation Programme
GST	Goods and Services Tax
QR	Quick Response (Code)



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MDSSC

Maharshi Dayanand Saraswati
Swadeshi Consortium



ABOUT US

Maharshi Dayanand Saraswati University, Ajmer proposes the establishment of the Maharshi Dayanand Saraswati Swadeshi Consortium as a multidisciplinary and collaborative institutional ecosystem dedicated to innovation-driven education, Bharatiya research traditions, startup culture, skill development, and sustainable national development rooted in Indian ethos.

The Consortium shall be the first and the only initiative of its kind in the State and among a select few in the country integrating innovation, incubation, research, entrepreneurship, indigenous knowledge systems, and community engagement under a unified institutional framework.



MDSU



Welcome to **Maharshi Dayanand Saraswati University**
Located in the historic city of **Ajmer, Rajasthan, Maharshi Dayanand Saraswati University (MDSU)** is a distinguished centre of higher learning that blends academic excellence with India's rich intellectual and Vedic heritage. Inspired by the life and teachings of Maharshi Dayanand Saraswati, the University promotes knowledge, ethical values, innovation, research, and social responsibility, empowering students to contribute meaningfully to society and national development. With a focus on quality education and holistic development, MDSU provides an environment where students can explore their potential, develop professional skills, and prepare for future opportunities.



CHARGE



CHARGE – Choyal Hub for Agribusiness, Research, Growth & Entrepreneurship – is a hub focused on agribusiness, skill development, innovation, and entrepreneurship. Established as CSMT, CHARGE now offers technical training, certified courses, research, incubation, and business support. A CSR initiative of **R.S. Choyal Group**, CHARGE works on a no-profit, no-loss basis to connect education, industry, and entrepreneurship. We aim to empower young entrepreneurs and industry professionals with practical knowledge and real-world opportunities. Through hands-on learning and industry exposure, CHARGE supports the growth of a skilled and innovative agribusiness ecosystem.

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