

Agriculture & Food Scientist Competency Matrix

Competency Area	Competency	Entry Level	Mid Level	Advanced Level
Food Safety & Quality	Ensuring agricultural and food products meet safety, nutrition, and quality standards.	Understands food safety basics, follows safety protocols.	Conducts inspections, testing, and quality assurance independently.	Designs food safety systems, leads audits, and advises on regulatory compliance.
Agricultural Research Methods	Applying scientific methods to study crops, livestock, and food production systems.	Assists with data collection and field/lab experiments.	Independently designs experiments, analyzes results, and reports findings.	Leads research projects, publishes findings, and advises on policy or innovation.
Sustainable Practices	Implementing sustainable farming and food production systems.	Understands basic sustainability principles.	Recommends sustainable practices to improve efficiency and reduce waste.	Leads sustainability initiatives and evaluates long-term environmental impact.
Biotechnology & Genetics	Using biotechnology tools for crop improvement and food innovation.	Familiar with basic biotech tools and lab procedures.	Applies biotechnology techniques in food and agricultural research.	Leads genetic modification projects, develops new bio-based solutions
Data Analysis & Modeling	Analyzing agricultural and food system data for decision-making.	Uses basic statistical tools and software.	Interprets complex datasets, models crop yields and food trends.	Develops predictive models and advises on data-driven policies.
Regulatory Compliance	Understanding food and agricultural regulations (FDA, USDA, international standards).	Understands basic regulatory requirements.	Ensures compliance in research and production processes.	Advises organizations on compliance strategies, participates in regulatory negotiations.
Communication & Extension	Translating scientific findings to farmers, industry, and policymakers.	Communicates results under supervision, prepares basic reports.	Delivers training, writes reports, and presents findings.	Leads outreach programs, advises policymakers, and represents organizations.
Innovation & Product Development	Developing new food products, crop varieties, or production technologies.	Assists in testing new methods or prototypes.	Leads product trials and validates new technologies.	Directs innovation strategy, patents new technologies, and brings products to market.