Sustainable

Warren Wilson College Food System

Campus Dining Policy

Warren Wilson College cultivates a campus food culture that celebrates the pleasures of producing, preparing and consuming sustainable food. We will promote participation of the campus community in a food system that contributes to economic vitality, environmental well-being, and the quality of life on campus, in our local community and throughout the WWC campus foodshed.

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The Warren Wilson College Sustainable Dining Policy

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Executive Summary

A *food system* is comprised of multiple, often disparate, systems of production, processing, marketing, distribution, catering/preparation, consumption, and waste management. Modern, conventional food systems employ economies of scale characterized by vertical integration, economic specialization, and high levels of technology and global trade, all largely based on the availability of inexpensive fossil fuels. A *sustainable food system* can be envisioned that ends this dependence on a continuous supply of inexpensive fossil-fuels and the associated social and environmental harms, promotes regional food security and socioeconomic equity, and enhances community resilience.

The procurement of food by the College and its dining services represents a powerful tool for promoting a sustainable food system. This policy presents a purchasing strategy that promotes sustainability in the campus food system by optimizing the mix of foods used by campus food services according to the following six objectives that, together, comprise an integrated, goal-oriented definition of *sustainable food* in terms of supply chain management:

1. Increase the use of fresh, minimally processed foods that meet sustainability standards to ensure socio-ecological sustainability of production and supply while supporting best practice in animal welfare;
2. Minimize food miles incurred through supply channels and support the local/regional economy;
3. Optimize the producer's share of the food dollar and emphasize direct purchasing from producers or producer cooperatives.
4. Optimize the use of sustainable foods produced on campus and encourage campus food system resilience;
5. Reduce adverse environmental impacts arising from institutional food systems operations as they exist, including greenhouse gas emissions, use and disposal of nonrenewable resources, and the production and export of waste from production and catering/consumption activities.
6. Minimize adverse operational impacts, be economically viable, and whenever possible, be cost-negative and revenue neutral while achieving the goals of this policy.

This policy makes use of a complex, adaptive systems approach to food system management and introduces an innovative sustainable decision tool based on a multi-criteria analysis of sustainability indicators to guide food procurement. This approach recognizes the complexity of managing for sustainability and offers a simple and flexible, yet rigorous framework to support the active development of a sustainable campus food system. Regular monitoring and evaluation of the campus food system using indicators to evaluate progress towards sustainability goals, and the regular revision of the policy goals will be critical to the success of this policy.

To ensure progress toward the goals of this policy, the creation of a Campus Food Policy Council is recommended to regularly review and evaluate food system performance and compliance with this policy. The Campus Food Policy Council members will represent the Warren Wilson College (WWC) community, campus food producers, the campus food service provider, and the local food system supplying campus dining services.

This policy was developed by the Local Foods Policy Task Force, a Presidential task force mandated in April 2008 to develop, in collaboration with dining services provider Sodexo, a policy to promote the use of locally-produced foods by Campus Dining Services. This policy was developed in accordance with the recommendations presented in *A Guide to Developing a Sustainable Food Purchasing Policy* recommended by the Association for the Advancement of Sustainability in Higher Education. The Task Force made a deliberate effort to harmonize this policy with the goals of the *WWC Climate Action Plan*.

Introduction

This document was created by the Warren Wilson College (WWC) Local Foods Policy Task Force, a Presidential task force mandated in April 2008 to develop, in collaboration with dining services provider Sodexo, a policy to promote the use of locally-produced foods by WWC Dining Services. This policy was developed in accordance with the recommendations presented in *A Guide to Developing a Sustainable Food Purchasing Policy*[1]. The Task Force made a deliberate effort to harmonize this policy with the goals of the *WWC Climate Action Plan*, released in September 2009.

This policy makes use of a complex, adaptive systems approach to the development of a sustainable campus food system. This approach recognizes the complexity of managing a food system for sustainability. Sustainability goals will change over time as a result of changes in a multitude of economic, environmental and social factors within and outside of the campus community. Regular monitoring and evaluation of the campus food system to evaluate progress towards sustainability goals, and regular revision of the policy goals will be critical to the success of this policy.

Sustainability in Practice at Warren Wilson College

Sustainability is a relatively enigmatic term that has come to mean many things to many people. The most commonly cited definition is (one of) the most ambiguous, originally laid out by the Bruntland Commission in 1989: "[to meet] the needs of the present without compromising the ability of future generations to meet their own needs."[2] There is now clear scientific evidence that humanity is living unsustainably—particularly true here in the United States—and that an unprecedented collective effort is needed to return human use of natural resources to within sustainable limits.[3] At the core of mainstream thinking about sustainable development is the goal of promoting well-being across the multiple dimensions of sustainability: environmental, social/cultural and economic. These three dimensions have been conceptualized as interlocking circles (to show they are not mutually exclusive and can be mutually reinforcing) depicting the microcosm, or *triple bottom line*, of sustainability, as well as concentric circles (to acknowledge he fact that the economy is a component of society which in turn is both bounded by and dependent upon, the environment) representing the macrocosm.

Warren Wilson College has been evolving its institutional practice of sustainability since its early days as the Asheville Farm School in 1894. In recent decades, the College has formalized a number of commitments to environmental responsibility and sustainability designed to guide community practices. In 2000, when Warren Wilson signed the Talloires Declaration, the College pledged to "create an institutional culture of sustainability." Then in 2003, trustees added "environmental responsibility" to the College's mission statement. Finally, in 2007, President Sandy Pfeiffer and the President's Advisory Council (PAC) adopted a sustainable decision making process, committing to an intentional use of these principles when planning for the College. This commitment to the practice of sustainability at WWC is summarized in its CAP, and reiterated on its website:

> "As a roadmap for community engagement, deep thinking, and accountability to present and future generations, sustainability frames the scope of our concerns. It reveals the extent to which the life we choose impacts our global family. We educate for sustainability at Warren Wilson College because our mission directs us to prepare students for responsible community engagement that promotes the common good."[4]

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1 The Association for the Advancement of Sustainability in Higher Education recommends this guide for use by colleges and universities wishing to manage campus dining services sustainably.

2 Regional Ecosystem Office (U.S) REO Information Center Definitions. Northwest Forest Plan (NWFP). Definition of ecological sustainability. Retrieved on: 4/11/2009

3 Millennium Ecosystem Assessment (2005). Ecosystems and Human Well-being: Biodiversity Synthesis. Summary for Decision-makers. pp.1-16. Washington, DC.: World Resources Institute. Retrieved 4/28/2009

4 Warren Wilson College Climate Action Plan (2009), pp. 5-7.

Procurement of goods and services by WWC and its contract providers represents a challenge and an opportunity to put this overarching policy into practice. In terms of food systems, the agricultural activities and food production capabilities of WWC have a unique role to play.

Sustainability in Food Systems

A *food system* is comprised of multiple, often disparate, systems of production, processing, marketing, distribution, catering/preparation, consumption, and waste management. Modern, conventional food systems employ economies of scale embodied by vertical integration, economic specialization, high levels of technology & pollution, and global trade, largely based on the availability of inexpensive fossil fuels. By applying the triple bottom-line model, a *sustainable food system*, then, can be envisioned that breaks the cycle of fossil-fuel dependence, promotes regional food security and socioeconomic equity, while curbing pollution and the dominance of agribusiness in food systems. Along these lines, the American Public Health Association (APHA) defines a sustainable food system as

> "one that provides healthy food to meet current food needs while maintaining healthy ecosystems that can also provide food for generations to come with minimal negative impact to the environment. A sustainable food system also encourages local production and distribution infrastructures and makes nutritious food available, accessible, and affordable to all. Further, it is humane and just, protecting farmers and other workers, consumers, and communities."[5]

A more goal-oriented definition comes from the UK Department of Environment, Food, and Rural Affairs (DEFRA). It has defined sustainability in food and farming [as]

> "systems of production, processing, marketing, distribution, and catering which meet the following five broad aims to 1)Raise production and process standards, 2)Increase tenders from small and local[6] producers, 3)Increase consumption of healthy and nutritious food, 4)Reduce adverse environmental impacts of production and supply, and 5)Increase capacity of small and local suppliers to meet demand. Additional objectives refer to increasing demand for organic food, improving choice for ethnic minorities, reducing waste, providing better conditions for catering staff, and improving data collection."[7]

From a purchasing perspective, this means considering not only the cost and quality of products, but also social and environmental factors associated with each purchase. From an institutional production perspective, this means considering not only farm profitability, environmental/biophysical "stewardship", and socio-economic prosperity, but also institutional population and involvement in food systems. As a practical matter, it requires seeking both 'value' and to satisfy 'values,' while assuring the security and continuity of supply and the smooth operation of the facility. With increased flows of information about product needs, product qualities, buyer interests and supplier capacities, sustainable purchasing is the basis for continued efforts to add value to products, and to improve social and environmental performance throughout the supply chain. It can also facilitate more mutually beneficial relationships between buyers and sellers.

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5 Toward a Healthy, Sustainable Food System (Policy Number: 200712). American Public Health Association. 2007-06-11. Retrieved on 2/27/2009.

6 "Local" refers to the geographic area delineated by Appalachian Sustainable Agriculture Project's (ASAP) *Appalachian Grown™* program, encompassing 57 counties within 175 miles of WWC in five states.

7 The policy is explained in DEFRA's PSFPI Guidance for Buyers.

Vision Statement

Warren Wilson College cultivates a campus food culture that celebrates the pleasures of producing, preparing and consuming sustainable food. We will promote participation of the campus community in a food system that contributes to economic vitality, environmental well-being, and the quality of life on campus, in our local community and throughout the WWC campus *foodshed*.[8]

Policy Statement

In a concerted effort to promote sustainability through the production, supply, and consumption of foods provided to the campus community by Warren Wilson College and its contracted service providers, we will work with our food suppliers, local farmers and community-based organizations to increase the availability of locally-sourced, sustainably-produced food in an effort to develop a vital local economy, a healthy environment and a high quality of life on campus, in our local community and throughout the WWC campus foodshed.

The procurement of food by the College and its dining services represents a powerful opportunity to put this overarching policy into practice. This policy presents a purchasing strategy that promotes sustainability in the campus food system by optimizing the mix of foods used by campus food services according to the following six objectives that, together, comprise an integrated, goal-oriented definition of *sustainable food* in terms of supply chain management:

1. Increase the use of fresh, minimally processed foods that meet minimum standards to ensure socio-ecological sustainability of production and supply while supporting best practice in animal welfare;

2. Minimize *food miles*[9] incurred through supply channels, supporting the local/regional economy;

3. Optimize the producer's share of the *food dollar*[10], emphasizing (more direct) purchasing from producers or producer cooperatives.

4. Optimize the use of foods produced sustainably on campus, keeping agricultural productivity in line with campus populations and encouraging campus food system resilience;

5. Reduce adverse environmental impacts arising from institutional food systems operations as they exist, including greenhouse gas emissions, use and disposal of nonrenewable resources, and the production and export of waste from production and catering/consumption activities.

6. Minimize adverse operational impacts, be economically viable, and whenever possible, be cost-negative and revenue neutral while achieving the goals of this policy.

To ensure progress toward the goals of this policy, the creation of a Campus Food Policy Council is necessary to regularly review and evaluate food system performance and compliance. The Campus Food Policy Council members will represent the WWC community, the campus food service provider, and the local food system supplying campus dining services.

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8 A *foodshed* consists of the complete path of a food from production to consumption and disposal. Analogous to a watershed, Integrated Regional Foodsheds use the efficiency of networks and systems design to dramatically reduce the costs associated with processing and transportation while increasing access to affordable, fresh, and healthy food options. Retrieved 10/14/2009

9 *Food miles* refers to the distance food is transported from primary production to consumption.

10 The *food dollar* refers to actual consumer spending on food products. It is commonly used to signify the proportion of this spending that a given economic sector captures on average.

Food System Sustainability Management: Strategies and Associated Goals

Strategy 1: Continual Development of Sustainable Supply Chain Management

Goal 1: By 2020, 50%[11] of total procurement of food and food-related supplies and services will come from sustainable sources as defined by the Sustainable Food Scoring System (SFSS).

Strategy 2: Reduce/Minimize adverse environmental impacts of food system operations.

Goal 2: By 2020, reduce overall use of energy, nonrenewable resources, and industrial inputs arising from food production and consumption activities on campus at least 25% from 2009 levels. [12]

Goal 3: By 2020, reduce total output to landfill at least 67% below 2009 levels.

Strategy 3: Promote a resilient campus food system.

Goal 4: By 2020, optimize the proportion of WWC -produced foods procured by Dining Services.

Strategy 4: Continual education for sustainability awareness.

Goal 5: Integrate WWC food system sustainability initiatives into wider triad of academics, work, and service, as well as student, guest, and staff awareness.

Strategy 5: Encourage intra- and inter-institutional collaboration.

Goal 6: Promote synergy within and between campus organizations working to achieve institutional sustainability goals.

Goal 7: Initiate communication with regional institutional food service providers for the purpose of exploring the potential benefits of cooperative promotion, education, purchasing, training and other actions to support sustainable dining in our region.

Goal 8: Initiate collaborations with National Association of College & University Food Services and industry for the purpose of sharing information gained through operation of our campus food system under this policy.

Appendix A provides an overarching view of how these goals interact with key objectives, strategies, tools, and monitoring indicators.

11 The initial goal of 50% recognizes that procurement of sustainable foods may be cost prohibitive in some cases, while supply may not exist in others. The Campus Food Policy Council will revise these goals annually, with the goal of continuous improvement of dining services.

12 WWC Climate Action Plan (2009).

WWC Dining Services – An Overview

Baseline Production & Marketing of Food Produced on Campus

In order to provide the baseline data need to optimize campus food production in support of the Sustainable Dining Policy, production and revenue data were analyzed for the campus farm (2007/8 and 2008/9 fiscal years) and campus garden (2006/7/8 calendar years) to provide average total revenue and production volumes.

This analysis suggests that, on average, revenue from a total of 42,750 lbs of food produced on campus was $182,356.50 from sales of beef ($85,529), pork ($63,477), eggs ($3,000), fresh produce ($23,617) and herbal products ($4,866.67). Total revenues (excluding herbal products) were earned through sales of $33,294.78 (16,153 lbs) to Sudexo for use in campus dining services, $4,233.33 (1,883 lbs) to a campus-based community supported agriculture (CSA) program, and $139,961.72 (43,574 lbs) to WWC community members and private individuals via campus-based sales. Graphs of production volume and revenues from campus-based food sales can be found in Appendix B.

Non-Renewable Energy Use and Greenhouse Gas Emissions Associated with Campus Food Production, Processing and On-Farm Storage

The annual WWC Greenhouse (GHG) Gas Emissions Inventory has begun tracking fuel usage and some fertilizer inputs (with estimated atmospheric emissions) to campus food production. Unfortunately, these measurements do not track those directly attributed to agricultural operations specifically. In addition, fertilizers contributing to GHG emissions have been excluded in past inventories (notably lime), along with embodied emissions associated with fertilizer production, processing and transport. Furthermore, agricultural inputs *without direct atmospheric emissions* are not currently being monitored. Finally, there is no monitoring of the energy inputs associated with the processing of campus food products or the on-farm storage of foods produced on campus. Therefore, the Campus Food Policy Council should work with the appropriate campus groups to ensure that the usage and impacts of these inputs by agricultural operations at WWC are regularly monitored and reported to the campus community.

Dining Services Purchasing Patterns: Food and Non-Food Materials

In order to provide the baseline data need to optimize dining service food purchases in support of the Sustainable Dining Policy, data were collected to analyze food purchasing patterns during the 2008/9 academic year. Total food purchasing in the 2008/9 academic year was $515,000, distributed among 10 food categories.

Two categories – Dairy and Fruits, Vegetables and Juice - accounted for more than 60% of the total food purchases by dining services. Food products from WWC accounted for over 50% of the Red Meat purchases and a small proportion of the Fruits, Vegetables and Juice purchases. See Appendix B for graphs presenting purchasing patterns of 10 food categories from the 2008/9 academic year.

Total non-food materials purchasing in 2008/9 was $36,237. This was distributed among four categories: disposable wares, linen & uniforms, office supplies, and cleaning supplies.

Dining Services Operations

Nonrenewable Resource Use

Monitoring of electrical use in all kitchens by the Energy Services crew began in November 2009, with results expected sometime in the spring of 2010. Natural gas usage for the entire Gladfelter building in the 2007/8 school year was 18,000 therms (1 them = 100,000 BTUs)[13], although this may or may not be used exclusively in the kitchens. Water consumption cannot be quantified at this time.

Recycling & Composting

The Recycling work crew is responsible for recycling a variety of waste materials currently produced by Dining Services, including: cardboard, paper, aluminum, glass, and plastic; steel, wood pallets, and other miscellaneous items. Used fryer oil is donated for conversion to biodiesel, but pick-up (Mountain Biofuels) is inconsistent. Over 31 tons of food waste is composted on-campus annually.

Education

Dining Services provides education and training for all employees (including 53-64 students on work crews) regarding goals, objectives, and sustainability principles of WWC Dining Services. The Local Foods work crew educates students about Sustainable Dining initiatives through materials provided in dining units to promote waste reduction and signage in cafeterias to alert students to locally grown menu options.

Collaboration

The WWC Dining Services staff works closely with the Work Program, the Farm and Garden Crews, the Recycling Crew, the Local Foods Task Force, Student Caucus and Staff Forum.

Current and Upcoming Sustainability Initiatives

There are a multitude of current and anticipated campus sustainability initiatives involving campus food production and dining services. Table 1 on the following page provides a comprehensive list of this initiatives characterized by food system sector. These initiatives are managed by variety of campus programs, but primarily are the responsibility of the WWC Farm, Garden, Recycling Crews, the Environmental Leadership Center and Dining Services.

13 2007-2008 WWC Greenhouse Gas Inventory

Table 1. Current and Upcoming (*in italics*) Campus Food System Sustainability Initiatives

Production	• 67% of all red meat (beef & pork) served in Gladfelter is produced on campus • Grass-finished beef, pasture-raised pork and poultry products are produced on campus and marketed to campus community and in region • Fresh produce served in Gladfelter is produced on campus • Herbal products are produced, processed and marketed to the campus community • Community, Permaculture and Dorm gardens • *High tunnels for season extension of fresh produce production*
Purchasing	• Fair Trade coffee and organic tea in Cow Pie Café • 100% vegetarian Cow Pie Café • >90% of apples sourced locally • Local honey and apple cider • Produce distributor works with local farmers to increase supply of local foods • *Use of ASAP mixing bowl program*
Processing and Preparation	• Cooler space to store fresh produce produced on campus • Freezer space to store campus produced meats
Consumption: Reducing	• All dining locations are tray-free as of 2009 • Disposable wares limited to unbleached napkins in Cow Pie; reduced usage in Gladfelter • Use of APEX washing system that monitors energy/water use • "Clean Plate" program to minimize waste • ELC's Green Event Guide recommends reduced consumption practices • Energy Services Crew will monitor water consumption in Gladfelter cafeteria starting in 2011
Consumption: Recycling	• Green Drum composting system *(capacity to increase in 2010)* • All dining locations recycle cardboard, paper, aluminum, glass, and plastic via Recycling work crew • All used fryer grease is donated for conversion to biodiesel, but pick-up (Mountain Biofuels) is inconsistent
Education	• Work opportunities with college farm, garden, landscaping, ELC and dining services crews. • Service Learning opportunities with MANNA food bank, Black Mtn. Community Garden, etc. • Academic learning opportunities in Environmental Studies, Social Science, and Global Studies programs. • Co-curricular learning through the Sustainability Internship Program
Collaboration	• Climate Action Plan on energy-conservation/reduction measures • *ELC on food carbon footprint monitoring* • Surplus produce is donated to MANNA food bank

Sustainability Roadmap: Strategies & Tools

Procurement/Purchasing: General Objectives

- Source products whose agricultural production or fisheries management practices promote the sustainability of the WWC foodshed.
- Increase tenders from local[14] producers and suppliers, prioritizing WWC-produced goods in accordance with the goals of this policy.
- Increase/maximize producer share of "food dollar".
- Increase procurement of minimally-processed and packaged goods.
- Find opportunities to preserve and store local produce for use throughout the year.
- Review purchasing of non-food materials used in the campus food system to maximize congruity with WWC Purchasing Pattern Language.
- Prioritize energy-efficiency when purchasing new equipment or revamping facilities operations.

Sustainable Food Purchasing Goals

Food purchasing guidelines for WWC and its contract service providers on campus will prioritize products produced with agricultural or fisheries management practices that promote the sustainability of the natural and human resources upon which our food supply depends and the local producers that use these practices, the processors, purveyors and supply chains that employ minimal processing and shorten the number of stops a food makes between production and consumption—effectively maximizing the producer share of the food dollar.

- By 2010 WWC will implement a scoring system designed to measure the degree to which individual food products and overall purchasing patterns meet its minimum sustainability standards as specified by this policy.

- By 2012 WWC will implement a 2nd-party certification system to certify a small number of very local farms that are unable to utilize 3rd-party certification schemes.

- By 2020, 40% total food purchases by WWC Dining Services will meet or exceed the minimum sustainability standards, with the following targets[15] for specific food groups as follows:

    - 90% of red meat (beef and pork, primarily from local sources)
    - 50% of fish, poultry and eggs
    - 50% of dairy products, particularly milk, butter, and cream
    - 50% of coffee/chocolate
    - 50% of sugar/sweeteners
    - 40% of fresh produce and juice (primarily from local sources)
    - 10% of grains, pasta, and cereals
    - 10% of seeds, nuts, legumes and plant oils
    - 10% of condiments, herbs, spices and tea
    - 10% of other/undifferentiated foods

- By 2020, 50% of all WWC food purchases (includes Sage Café, Campus Bookstore, etc.) will meet or exceed the minimum sustainability standards.

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14 Local refers to the area covered by the Appalachian Sustainable Agriculture Project (ASAP) A*ppalachian Grown™* label

15 These targets are based on current and expected near term increases local food production as discussed in Appendix D.

General Purchasing Guidelines

The discussion of sustainable agriculture and the key indicators of sustainable farming and food systems presented in Appendix C offer a basic framework and approach for making sustainable food purchasing decisions. In the event that future issues arise due to unforeseen causes, those responsible for implementing this policy should return to this pattern language for guidance.

Sustainable Food Scoring System

This policy utilizes an integrative, goal-oriented definition of sustainable food as a basis for the evaluation of purchasing and supply chain management of foods used in campus dining services. *Sustainable food* is that which a) promotes the health and well-being of the natural and human resource base upon which agricultural production and/or wild caught fisheries depends, b) minimizes food miles and promotes community resilience[16], and c) maximizes the producer share of the food dollar and supports local/regional economies.

These three characteristics of sustainable food can be evaluated in a scoring system applied to all food products used in campus dining services. Table 1 shows the relationships between these three food system characteristics, some indicators that can be used to evaluate each characteristic and the scoring factors used in the food scoring system to represent each characteristic.

Table 2. Relationships Between Food Characteristics and Sustainability Scoring Factors.

Sustainability Characteristics	Sustainability Indicators	Scoring Factor
Promote health and well-being of the human and natural resources upon which food production depends	Verifiable product certifications (agricultural)[17] Monterrey Bay Aquarium recommendations (seafood)	Production Method (PM)
Minimize "food miles" and promote community resilience	Proximity of grower, packager, processor, and distributor(s) Number and availability of WWC farm products Food System-related proportion of Work Program	Purchasing Geography (PG)
Maximize producer share of "food dollar" and support local/regional economy	Length of supply chain	Supply Chain (SC)

Using a Multi-Criteria Analysis, the sustainability of a given food product is represented by a numerical score indicating the degree to which these three characteristics, taken together, promote the sustainability of the WWC foodshed.

Three Scoring Factors: Production Method, Purchasing Geography and Supply Chain

Food production and wild catch fisheries methods are evaluated based on whether or not the food was produced under a third party certification program. Certification programs are ranked according to the degree to which the required production methods *promote the health and well-being of the human and natural resource base upon which that production depends*. Food produced under the Food Alliance certification program is awarded the highest rating. See Appendix D, Table D2 for a list of the 3rd Party certification programs selected for use in the Production Method scoring factor.

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[16] Resilience is defined as the capacity of a system (e.g., a campus community) to absorb shocks (e.g. disruption of a resource flow such as energy or an extreme weather event) and maintain healthy form, structure and function.

17 Refers primarily to *verifiable* 3rd-party certifications, conducted by an agency independent of producer and consumer.

The purchasing geography scoring factor evaluates food system characteristics that *minimize food miles and promote community resilience* by determining the proximity of the producer, processor and distributor food system sectors to the WWC campus. Food produced and processed on campus is awarded the highest rating.

The supply chain scoring factor evaluates food system characteristics that *maximize producer share and support for local/regional economy* by determining the length of the supply chain. Supply chains with most direct route between producer and campus dining are awarded the highest rating.

The Sustainable Food Score

The Sustainable Food Score is a numerical expression of the sustainability of individual foods consumed by campus dining services. This score is comprised of numerical values that represent food characteristics related to sustainability considerations across multiple dimensions. Summed over all food purchases, the Food Sustainability Score provides a direct, quantitative measure of how well the campus food system promotes sustainability throughout the WWC foodshed.

The three part nature of the sustainability scoring system recognizes the complexities involved in sourcing sustainable food. Dining Services employees responsible for food procurement must adapt their purchasing decisions to a continuously shifting array of food characteristics throughout the year. For example, local vegetables are less expensive than nationally sourced vegetables in some parts of the year, but not others. The scoring system supports variable sourcing of vegetables in different seasons to meet the sustainability goals while staying within budget. The sustainable scoring system is a flexible decision tool that supports creative sourcing of foods of varying characteristics so that campus dining services can achieve the goals of this policy by combining foods that, on the whole, possess the characteristics defined as sustainable by this policy.

A food is scored in a two step process. First, the food is evaluated according to how well it embodies the three characteristics of sustainable food: production methods earn a score between -1 and 4, proximity earns a score between -1 and 4, and the length of the supply chain earns a score between 0 and 4. After the food is evaluated for each characteristic, the three characteristics scores are summed to determine the sustainable food score. For the purposes of this policy, a sustainable food is one that has a sustainability score equal to a minimum of 5.

Table 2 provides some examples of the food characteristic scores and the sustainability scores for a variety of foods. A detailed explanation of the sustainable food scoring methodology can be found in Appendix D.

Table 3: Sustainable Food Score Examples.

Food	Production Method (PM)	Purchasing Geography (PG)	Supply Chain (SC)	Sustainable Food Score
WWC salad greens*	0 (4)	4	4	8 (12)
Milk from Happy Cow Creamery	2 (grass-based)	3	4	9
Finca El Porvenir coffee (Atlas Importers)	4 (RA)	1	3	8
Rainbow trout, Sunburst Trout, Canton, NC	3 (Best choice)	4 (local)	1.5	8

*Foods produced on campus are not currently 3rd party certified. In this example, campus-produced foods are give a PM score of 0 (not currently certified) and a hypothetical PM score of 4 (Food Alliance certified).

Non-food materials purchasing: Equipment, Materials & Supplies

Non-food purchasing decisions should be made in accordance with WWC Purchasing Pattern Language (2001) and the WWC Climate Action Plan (2009). The Purchasing Pattern Language guidelines stipulate that purchasing should be conducted with suppliers that guarantee freedom from unfair discrimination, employee health & safety, and a living wage. Furthermore, supplies should be purchased on the basis of least-impact on the biosphere, prioritizing energy efficiency, ease of recycling, minimal packaging, and/or minimal environmental impact, as applicable. The Climate Action Plan guidelines emphasize centralized, bulk purchasing from green vendors, Energy Star™ certification, and advocate the use of the Sustainability, Tracking, Assessment & Rating System (STARS) guide from the Association for the Advancement of Sustainability in Higher Education (AASHE) for Campus Store purchasing.

Reduce and Recycle

The Campus Food Policy Council is directed to work with the appropriate campus groups to: 1. improve monitoring and reporting capability for building systems and equipment performance, 2. reduce energy use and waste/fossil fuel emissions in kitchens by utilizing industry best practices as appropriate, 3. reduce food waste, 4. recycle all food waste produced on campus, 5. strive to manage energy use in dining service facilities to support the campus Climate Action Plan goals, and 6. follow the campus purchasing pattern language.

Specific Goals[18]

- By 2012, recycle 100% of fryer oil
- By 2013, reduce energy consumption by 20% from 2007/8 levels
- By 2015, increase food recycling rate to 67%[19]
- By 2020, reduce energy consumption by 80% from 2007/8 levels

Resilience

Understanding the concept of resilience is central to the successful management of complex systems for sustainability. Resilience is the capacity of a system (such as a food system or a college campus community) to absorb disturbance and while maintaining the same function, structure, and identity.[20] Resilience is a required condition of, but distinctly different from, sustainability. Managing for resilience focuses sustainable development on strategies that promote the capacity of social-ecological systems to cope with, adapt to, and shape change, thereby enhancing the likelihood of sustaining healthy community structure and function in world characterized by the challenges of global warming and the increasing costs and uncertain availability of basic resources such as energy, water and material goods.

The productive capacity of the WWC campus, combined with the Triad model of education, provides a unique opportunity to promote the resilience of the campus food system. Managing for campus food system resilience involves the consideration of a variety of production issues including the size of the campus population relative to the productive capacity of campus working lands, the off-campus inputs required for food production, processing, storage, consumption and waste disposal and student, staff and faculty knowledge of and involvement in the campus food system.

[18] Goals derived from WWC Climate Action Plan
[19] Informed by WWC CAP & food waste/composting data from 2008 Greenhouse Gas Inventory
[20] Resilience and Sustainable Development: Building Adaptive Capacity in a World of Transformations, WSSD, 2002

The Campus Food Policy Council is directed to collaborate with the appropriate campus groups to identify, develop, and implement least-cost measures to increase *the resilience of WWC working lands and food system operations*, with an emphasis on initiatives that:

1. are cost-effective, displacing the greatest quantity of unsustainable food procurement by Dining Services while enhancing overall profitability, environmental quality, and community resilience of campus working lands,
2. produce products that are unavailable or cost-prohibitive from local/regional sources in quantity & quality that is useful to Dining Services operations,
3. engage and support the local farming community, particularly in the Swannanoa Valley.

Appendix E presents some historic trends regarding the resilience of the campus food system.

Education

This policy recognizes the important leadership that WWC students have taken to bring sustainable practices to life on campus. Through direct student action, proposals have been written through the years that have established the vegetarian Cowpie Café, the green standards for the EcoDorm, the Recycling Program, the EcoTeam outreach program, the EcoDorm's permaculture, the Green Drum Composter, Real-Time Monitoring, and many other best practices.

The Campus Food Policy Council is directed to collaborate with the appropriate campus groups to promote the integration of sustainable food issues on campus through the following means:

1. Encourage students to continue to champion best practices on their work crews,
2. Use dining halls as central points for sustainability information,
3. Train new work crews and employees in sustainability initiatives at on-boarding,
4. Use field trips to local farms to connect students with farmers who supply food to WWC,
5. Integrate local and sustainable food system topics into appropriate academic courses and curricula,
6. Encourage independent research on WWC food systems from multiple academic perspectives,
7. Develop models and materials useful to other institutions while recognizing the unique institutional capabilities of WWC.

Collaboration

Sharing information gained through the management of the campus food system, both on our campus and beyond through collaborative learning is fundamental to the mission of WWC. The Campus Food Policy Council is directed to collaborate with the appropriate campus groups to:

1. Monitor sustainable food system indicators and make regular and timely reports to the campus community through a variety of media,
2. Celebrate the pleasures of producing, preparing and consuming sustainable food,
3. Improve the resilience of the campus food system,
4. Support student-led initiatives,
5. Support regional initiatives to promote, enhance, and sustain agriculture in western North Carolina,
6. Explore opportunities for collaboration and cooperation among local institutions with food production and/or catering operations,
7. Generate synergy with local food initiatives (for example, ASAP's Farm to School program), and
8. Provide accurate and timely information about the campus food system to local, state and national organizations by regular reporting through a variety of media.

Monitoring & Evaluation

This policy takes an adaptive approach to the development of a sustainable campus food system. This approach recognizes the complexity of managing a food system for sustainability and the reality that the goals of this policy will likely change over time as a result of changes in a multitude of economic, environmental and social factors within and beyond the campus community. Regular monitoring and evaluation of the campus food system to evaluate progress towards sustainability goals and regular revision of policy goals and objectives will be critical to the success of this policy. A set of sustainability indicators selected for evaluating the effectiveness of this policy can be found in Appendix F.

The monitoring and evaluation functions of this policy will be the responsibility of the Local Food Crew and the Campus Food Policy Council, in collaboration with appropriate campus groups. The Local Food Crew will assist in sustainable food procurement, collect and report the food system data necessary to evaluate food system performance and inform educational and collaborative projects about the campus food system. On an annual basis, the Campus Food Policy Council will review Local Food Crew reports, evaluate food system performance as it relates to policy goals, and report their findings to the campus community. The Campus Food Policy Council will also recommend to the President of the College policy changes likely to improve food system performance.

Monitoring Sustainability with Indicators

The Local Foods Crew will monitor food purchases and conduct the research needed to provide an annual report to the Campus Food Policy Council on a set of food system indicators as the primary means to assess the sustainability of production, supply/ procurement, and consumption/catering operations in the College's food system. Progress toward policy goals will be determined by the observed trends in these indicators over time. See Appendix F for a list of the full indicator set and data collection and reporting responsibilities. See Appendix C for a discussion of the use of food system indicators in sustainability assessment.

Communication Plan

Ultimately, the success of this policy will depend on the enthusiasm, commitment and creativity of the people who will implement the policy and strong community support for their work. Effective communication of policy goals, lessons learned along the way, and the successes and failures of the effort to create a sustainable campus food system will be critical to the success of this policy. The Campus Food Policy Council has the responsibility to collaborate with the appropriate campus groups to provide direction, coordination, and evaluation of campus communications related to this food policy.

Although every campus community member has a stake in the campus food system, the level of interaction with the food policy will vary. Primary stakeholders are those with direct responsibility for making decisions that are influenced by this policy. These include College Administrators, the Campus Food Policy Council, Dining Services managers, staff and work crews, and the college committees and work crews responsible for managing campus working lands. These stakeholders have a responsibility to make decisions that meet policy requirements, to inform the campus community about matters pertaining to the policy and also to invite community discussion about the implementation of the policy.

A diverse array of off-campus organizations will also have an interest in this policy. These include local businesses that produce, process, or distribute the foods consumed on campus, local organizations that promote sustainable food in our region, and local media with an interest in reporting on food issues.

Index of Tables and Figures

Appendix A: Policy Overview

Table A1 presents a concise overview of the Sustainable Dining Policy and shows the relationship between policy strategies, objectives, actions, tools, and examples of recommended monitoring indicators.

Table A1. Overview of the Sustainable Dining Policy

Strategies	Objectives	Actions	Tools	Indicators
Sustainable Supply Chain	Increase procurement of food products that promote sustainable production systems, minimize food miles, minimize the food supply chain/maximize producer-share of food dollar, and promote institutional resilience	Implement Food Purchasing Policy	Sustainable Food Scoring System, Food Audit	• Percentages of purchases of specified products or categories that meet minimum purchasing criteria • Total miles traveled from farm to WWC of selected food groups • Campus budget on food products • Affordability of local food • Ratio of local (Appalachian Grown or closer) vs. non-local sources
Reduce Campus Operations Impacts	Reduce energy and resource use, fossil fuel emissions, and waste production and export and increase recycling.	Employ effective resource conservation and process efficiency measures	Annual Energy Audit, Purchasing Pattern Language, 3rd-party certifications for campus working lands	• Energy use • Food waste (pre- and post-consumer) produced • Packaging waste produced • Percentage of food lost to spoilage and mishandling • Output to landfill • Greenhouse gas emissions • Agricultural input:yield ratio • Agricultural inputs
Resilience	Enhance the capacity for campus-based food production, processing, storage and preparation	Cultivate the natural, built, and human resources needed to create food system resilience	Work Program, Whole Farm Planning, Systems Analysis, Resource Monitoring and Assessment	• Agricultural productivity per capita • Proportion of student work crew positions involved in food system • Proportion of campus agriculture sales/production to dining services
Education	Integrate WWC food systems sustainability initiatives into wider student/guest/staff awareness	Use a variety of methods to communicate food policy info to diverse audiences on campus	Reports to campus community via website/other media, Collaboration with work, service and academic programs, Campus celebrations and other food policy events	• Student participation in food-system focused classes and service opportunities • Participation of the campus community in food system related events on campus • Campus community awareness of food system sustainability issues • Campus community willingness to pay for sustainable food
Collaboration	Support synergy among local institutional food initiatives, and provide tours, information, and presentations to NACUFS & industry	Document and share lessons learned	Reports to institutional food service community via website/other media Host informational campus tours and on-campus workshops	• Number of visitors to campus with a specific interest in the campus food system • Number and variety of food system reports, publications and other educational materials made available to the public • Collaboration with other institutional food system initiatives, NACUFS and industry

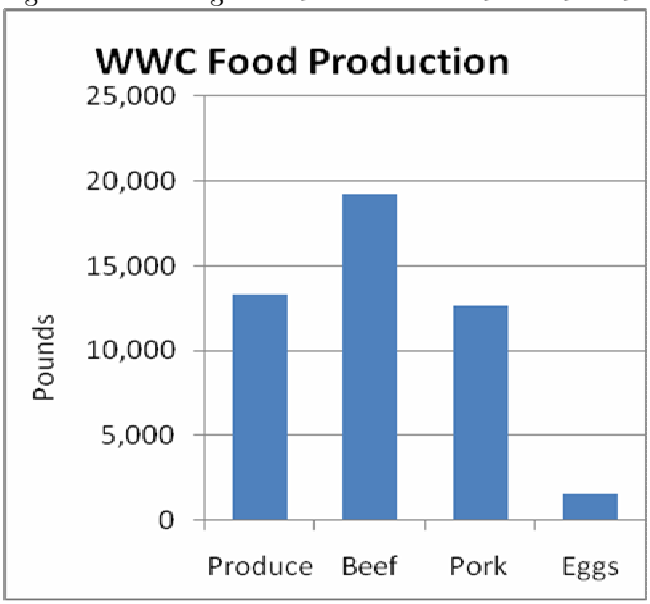
Appendix B: WWC Dining Services - An Overview

Average Food Production & Sales Distribution at WWC

In order to provide the baseline data need to optimize campus food production in support of the Sustainable Dining Policy, production and revenue data were analyzed for the campus farm (2007/8 and 2008/9 fiscal years) and campus garden (2006/7/8 calendar years) to provide average total revenue and production volumes. This analysis suggests that, on average, revenue from a total of 46,684 lbs of food produced on campus was $180,490 from sales of beef ($85,529), pork ($63,478), eggs ($3,000), fresh produce ($28,483) and herbal products ($4,866.67). Total revenues (excluding herbal products) were earned through sales of $33,294.78 (16,153 lbs) to Sudexo for use in campus dining services, $4,233.33 (1,883 lbs) to a campus-based community supported agriculture (CSA) program, and $139,961.72 (43,574 lbs) to WWC community members and private individuals via campus-based sales.

These production and sales data, along with productivity per acre in terms of pounds of food produced and sales revenue are reported below as graphs. The acreage associated with each product was estimated at 3.5, 305, 30, 1 for produce, beef, pork and eggs, respectively.

Figure B1. Average Production of Foods Produced on Campus



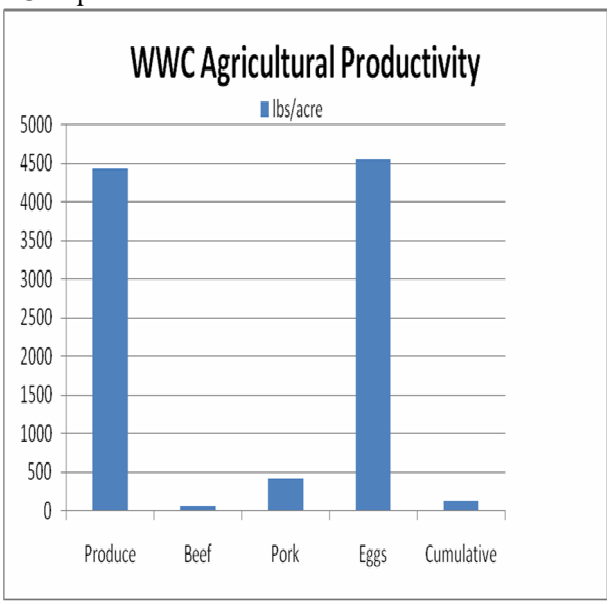


Figure B2. Average Sales Revenues of Foods Produced on Campus

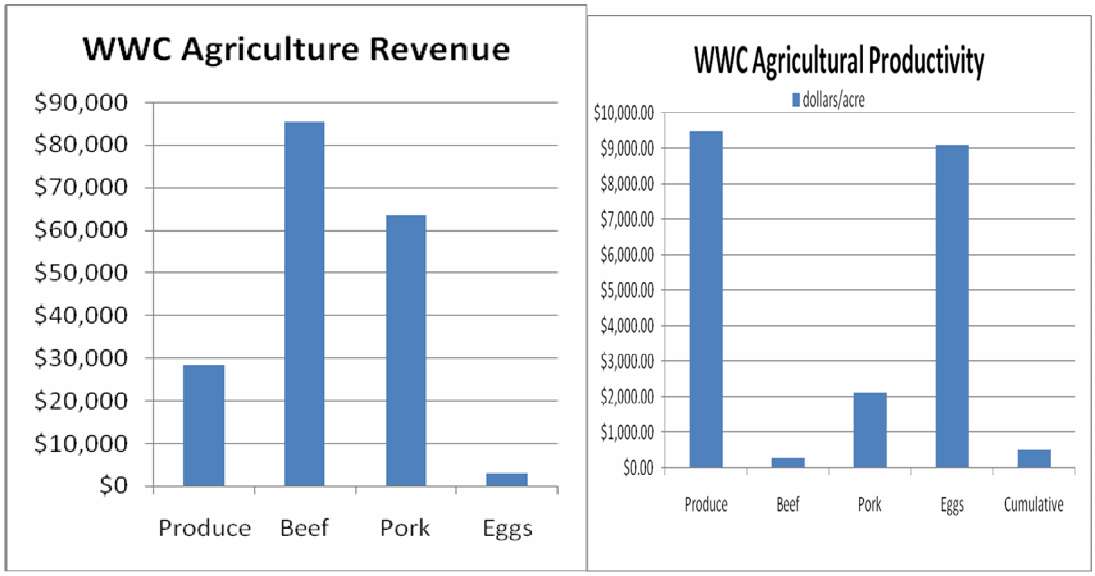
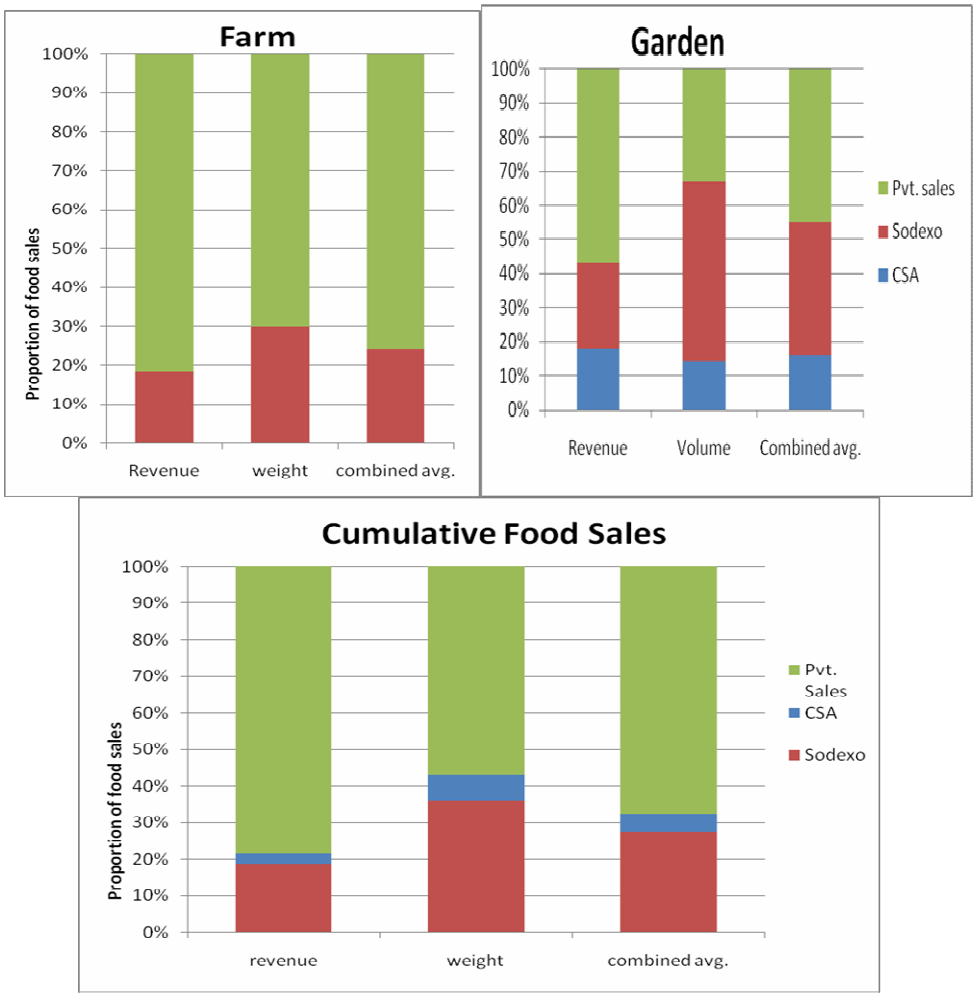


Figure B3. Distribution Channels of Campus Produced Food Sales from Garden, Farm and Total (Garden + Farm)



Appendix C: Food System Sustainability Indicators

Examining food and agriculture through the lens of sustainability reveals a complex web of interrelated issues. A partial list includes issues involving the welfare of rural communities and farm labor, animal welfare, the use of hormones and non-therapeutic antibiotics in livestock production, genetic modification of crops and livestock, environmental contamination with agricultural chemicals, water quality impacts and competing water uses, soil degradation, the protection of wildlife, impacts on local economies, food quality & safety, and contribution to global warming[21].

Sustainable agriculture emerged in the U.S. in the 1980's as a grassroots response to many of these issues. The U.S. Congress defined sustainable agriculture in the 1990 farm bill as

> "an integrated system of plant and animal production practices having a site-specific application that will, over the long term, satisfy human food and fiber needs; enhance environmental quality and the natural resource base upon which the agricultural economy depends; make the most efficient use of nonrenewable resources and on-farm resources and integrate, where appropriate, natural biological cycles and controls; sustain the economic viability of farm operations; and enhance the quality of life for farmers and society as a whole."[22]

Managing for sustainability in agriculture and food systems is difficult because of the multiple dimensions and the long time scale implied and also because of the complexity of the systems under management. Because of these challenges, managing for sustainability necessarily involves system assessment over time using a set of leading indicators that represent the multiple dimensions of sustainability. An indicator is a simple measure of a system characteristic that provides information about the quality (is it resilient or brittle?) or state (is it healthy or unhealthy?) of a system. A leading indicator measures a quality or state of a system that changes quite rapidly in response to changes in management. Sustainability indicators provide information about system characteristics specifically related to qualities that are understood to confer sustained, healthy function to the system.

The indicators reported in the table on the following page are in common use in the European Union to assess progress toward food system sustainability goals. Sustainability indicators are arranged in the table with the main columns representing the three sustainability pillars: Economic, Environmental and Social. The main criteria within each pillar are numbered and the indicators used to assess each criterion are reported in a bulleted list below each criterion.

These indicators can be used to assess the sustainability of the WWC food system. In fact, many of these indicators directly evaluate the food system characteristics that determine the Sustainable Food Score. Those indicators that evaluate Production Sustainability are listed in plain text. Sustainability indicators that are <u>underlined</u> evaluate Food Miles, and those in *italics* signify indicators that evaluate the Supply Chain. **Emboldened** indicators are addressed by other objectives of this policy, individually or collectively. Regular evaluation of trends in these indicators over time can be used to determine the success of this policy.

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21 There are many reports documenting the sustainability issues arising from industrial agriculture. See, for example, Sustainable Agriculture Systems, C. A. Edwards, R. Lal, P. Madden, R. Miller and G. House, 1990, Soil and Water Conservation Society, Sustainable Agriculture Systems, J. Hatfield and D. Karlen, Eds, 1994, CRC Press, and Life Cycle-Based Sustainability Indicators for Assessment of the U.S. Food System, M. Heller and G. Keoleian, 2000, Center for Sustainable Systems.

22 USDA. Food, Agriculture, Conservation, and Trade Act of 1990 (FACTA), Public Law 101-624, Title XVI, Subtitle A, Section 1603

Table C1. Sustainability Indicators for Farming and Food Systems[23].

Economic	Environmental	Social
Farm Productivity: ● Farm Incomes ● Value-added activities ● Collaboration ● Commodity yields ● Whole-farm approach ● Benchmarking ● Farm Assurance Schemes ● Organic Farming ● **Skills & Training** ● Financial Risk ● Cost of regulation	***Food Chain Impacts:*** ● Fertilizer use ● River water quality ● Pesticide use ● Pollution incidents ● Waste ● Good agricultural and environmental conditions ● *Energy use* ● Air quality ● Entry-level stewardship ● **Food transportation**	***Public Health:*** ● **Obesity (-)** ● *Dietary health* ● Foodborne illness ● Workplace safety
Food Chain Productivity: ● ***Capital Investment*** ● ***Investment in R&D*** ● *ASAP membership*	***Better use of natural resources:*** ● Soil quality ● Water use ● Non-food crops	***Animal Health & Welfare:*** ● Farm health plans ● **Skills & Training**
Cost of Production Support ● Costs & cost-sharing of animal disease (-) ● Value of direct farm subsidy payments (-)	***Landscape & Biodiversity:*** ● Species & biodiversity ● Wildlife habitats ● **Landscape value** ● Access to countryside ● Higher level stewardship ● Genetic diversity	***Rural Well-Being:*** ● *Rural economy* ● Countryside visit expenditures ● **Diversification** ● Labor

23 Adopted from DEFRA (UK) *Sustainable Farming and Food Strategy Indicators*.
* Or similar regionally-based sustainable agriculture organization

Appendix D: Sustainable Food Scoring System

This section details the rationale and the methodology used to determine the "sustainability score" of foods moving through campus Dining Services. The sustainability score is a key indicator of the progress made towards the policy vision to promote the sustainability of the WWC foodshed.

We use an integrative, goal-oriented definition of sustainable food as a basis for the evaluation of purchasing and supply chain management of foods used in campus dining services. *Sustainable food* is that which a) promotes the health and well-being of the natural and human resource base upon which agricultural production and/or wild caught fisheries depends, b) minimizes food miles and promotes institutional resilience[24], and c) maximizes the producer share of the food dollar and supports local/regional economies.

These three characteristics of sustainable food can be evaluated in a scoring system applied to all food products used in campus dining services. Table 1 shows the relationships between the three food system sustainability characteristics, the indicators that were used to evaluate each characteristic and the scoring factor used in the sustainable food scoring system to represent each characteristic.

Table D1: Relationship of Food Characteristics and Sustainability Scoring Factors.

Sustainability Characteristics	Sustainability Indicators	Scoring Factor
Promote health and well-being of the human and natural resources upon which food production depends	Verifiable product certifications (agricultural)[25] Monterrey Bay Aquarium recommendations (seafood)	Production Method (PM)
Minimize "food miles" and promote community resilience	Proximity of grower, packager, processor, and distributor(s) Number and availability of WWC farm products Food System-related proportion of Work Program	Purchasing Geography (PG)
Maximize producer share of "food dollar" and support local/regional economy	Length of supply chain	Supply Chain (SC)

Using a Multi-Criteria Analysis, the sustainability of a given food product is represented by a numerical score indicating the degree to which these three characteristics, taken together, promote the sustainability of the WWC foodshed.

Multi-Criteria Analysis Methodology

Multi-Criteria Analysis (MCA) using sustainability indicators can be employed to express the degree to which food systems, or any other complex system, promote sustainability. Multi-Criteria Analysis is well-suited to quantifying sustainability because it offers users the ability to estimate one numerical value to express a complex set of quantitative and qualitative indicators.

[24] Resilience is defined as the capacity of a system (e.g., a campus community) to absorb shocks (e.g. disruption of a resource flow such as energy or an extreme weather event) and maintain healthy form, structure and function.

[25] Refers primarily to *verifiable* 3rd-party certifications, conducted by an agency independent of producer and consumer.

The Sustainable Food Score is a numerical expression of the sustainability of individual foods that travel through the WWC food system. This score is comprised of numerical values that represent food characteristics that are related to sustainability considerations across multiple dimensions. Summed over all food purchases, the Food Sustainability Score provides a direct, quantitative measure of how well the campus food system promotes sustainability throughout the WWC foodshed.

Calculation of the sustainability score for each food item involves several steps. First, for each of the three sustainability dimensions of the food – Production Method, Purchasing Geography, and Supply Chain – performance levels are defined with reference to sustainability indicators and scores for each of the three dimensions are calculated using an MCA. Second, the scores for these three dimensions are uniformly scaled and then summed to calculate the final Sustainability Score.

Detailed explanation of the MCA scoring procedure for each of the three dimensions of sustainability and an example of each score are presented next.

The Production Method Score: Evaluating the Sustainability of Agricultural and Fisheries Products

Agricultural Products

The Production Method (PM) score evaluates the sustainability of the production system under which foods are produced. Preference is given to foods produced under 3rd party certification[26]. Ten existing 3rd party certification programs were chosen to represent a range of production systems that would likely promote sustainability in the WWC foodshed to greater or lesser degree. In addition, foods produced without 3rd party certification were assigned an arbitrary baseline production sustainability score equal to zero and foods containing GMO products or grown in hothouse production systems were assigned an arbitrary score equal to -1. The negative production scores were used to signal the sustainability concerns associated with GMO crops and the intensive energy inputs required for hothouse production systems.

Certification programs were analyzed to find the sustainability indicators directly related to approved production practices under the certification scheme. Production standards for each verification program were analyzed and relevant sustainability indicators were selected to represent each standard. Points are awarded based on the number of indicators and the extent to which the program addresses each indicator within each of the three "pillars of sustainability" – economic, social/cultural and environmental. Scores for each "pillar" represent the number of potentially adverse impacts of production and supply the certification seeks to avoid.

Table D2 on the following page presents the specific sustainability indicators represented by each 3rd-party certification[27] included in the sustainable food scoring system and the economic, social/cultural, and environmental score assigned to each.

[26] Verification scheme in which production activities are inspected by a company independent of producer or distributor. The 3rd-party certification company confirms the legitimacy of claims made by food producers and distribuors, thus ensuring that the food labels are meaningful. For an overview of common labels, see http://www.greenerchoices.org/eco-labels/

Table D2. Sustainability Indicators and Production Sustainability (PS) Scores For 3rd Party Certifications[28]

3rd-party Certification	Economic	Econ	Social/Cultural	S/C	Environmental	Env
Food Alliance	Benchmarking Farm Incomes Whole-farm approach	3	Workplace Safety Labor Farm Animal Health Plans	3	• Pollution Incidents • Good Ag/Env. Conditions • Pesticide Use • Soil quality • Water use • Wildlife Habitat	6
Rain forest Alliance	Benchmarking Farm Incomes Whole-farm approach	3	Workplace Safety Labor	2	• Higher level stewardship • Species & Biodiversity • Pesticide Use • Waste • Soil quality	5
Biodynamic	Whole-farm approach Farm Incomes Organic Farming	3	Dietary health	1	• Soil quality • Pesticide Use • Fertilizer Use • Higher Level Stewardship • Pollution Incidents • Good Ag/Env. Conditions	6
Fair Trade	Financial Risk (Min. price guarantee) Farm incomes	2	Farmer Suicide Rates (Sm.-scale agriculture) Workplace safety	2	Pesticide Use Fertilizer Use Good Ag/Env. Conditions	3
Organic	Organic Farming Farm Incomes	2	Dietary Health	1	• Pesticide Use • Soil quality • Good Ag/Env. Conditions	3
Naturally Grown*	Cost of regulation Farm Incomes	2	Rural Economy	1	• Pesticide Use • Soil quality • Good Ag/Env. Conditions	3
Protected Hvst.		0	Dietary Health	1	Pesticide Use	1
Grass-based	Farm Incomes	1			Good Ag/Env Conditions Food transportation	2
Shade-grown		0			Higher level stewardship Good Ag/Env conditions	2
Humane Raised		0	Livestock health plans	1		0
Non-GMO		0		0	Pollution Incidents	1
Hothouse Grown		-1		-1		-1
Contains GMOs		-1		-1		-1

* Not strictly a 3rd-party certification, Certified Naturally Grown is a cooperative verification scheme commonly used to avoid high costs of other comparable certifications.

[28] Verification scheme in which production activities are inspected by a company independent of producer or distributor. The 3rd-party certification company confirms the legitimacy of claims made by food producers and distribuors, thus ensuring that the food labels are meaningful. For an overview of common labels, see http://www.greenerchoices.org/eco-labels/

Calculating the Production Method Score

For each certification program considered, a multi-criteria analysis was performed on the pillar scores using a three dimensional approach – each dimension being one of the three pillars of sustainability – to calculate the production sustainability score for each certification program. Using the results of this MCA, certification programs were ranked according to the degree that the certified production methods *promote the health and well-being of the human and natural resource base upon which that production depends*.

For example, the Food Alliance certification program was rated a 4 along the Social/Cultural axis, a 2 along the Economic axis, and 7 along the Environmental axis, as illustrated in Figure D1 (note that scale is natural log). A three-dimensional triangle with sides equal to 4, 2 and 7 has a volume equal to 20,825. Taking the base-10 log of this volume gives a value of 4.01, which is used as the Production Method score for Food Alliance certified products.

Likewise, the Production Method scores reported in Table D3 on the next page were determined for each certification program selected for use in this policy.

Figure D1. Conceptualization of MCA for Food Alliance Certification Production Method Score.

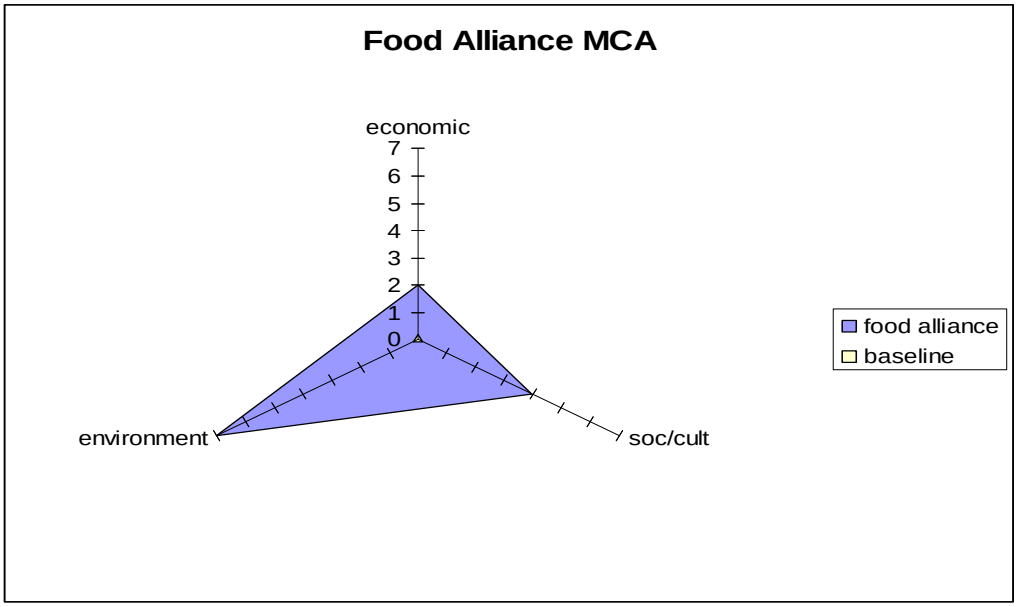


Table D3. Three Dimensional Axis Values, Triangle Volume and Production Method Scores Determined by an MCA of Selected Agricultural Certification Programs.

Certification or Other Production Characteristic	Sustainability Pillar Scores			Volume of Triangle	Production Method Score (PM)
	economic	soc/cult	environment		
Food Alliance	3	5	7	3477	4.3
Rainforest Alliance	3	4	6	1096	3.8
Biodynamic	4	2	7	470	3.4
Fair Trade	3	3	4	268	3.2
Organic	3	2	4	98	2.8
Naturally Grown*	2	2	4	36	2.3
Grass-fed + Humane	2	2	3	27	2.2
Grass-fed	2	1	3	10	1.8
Protected Hvst.	1	2	2	6	1.6
Shade-grown	1	1	3	5	1.3
Humane Raised	1	2	1	3	1.3
Non-GMO	1	1	2	2	1.1
Baseline	0	0	0	0	0
Known GMO content	-1	-1	-1	-0.02	-1.0
Hothouse grown	-1	-1	-1	-0.02	-1.0

Note: Combinations of certifications (e.g. Organic + Fair Trade) cannot merely be summed. Their scores must be tallied and a new triangle plotted to determine their Production Method score.

Seafood

Sustainable seafood has been defined by the Monterey Bay Aquarium as "[aquatic food species] from sources, whether fished or farmed, that can exist into the long-term without compromising species' survival or the integrity of the surrounding ecosystem."[29] These guidelines address capture methods and fishery-specific issues, so a given species may appear on multiple lists, based on where and how they are being caught. Additionally, a handful of 3rd-party certifications exist that address some adverse secondary impacts from fishing methods and seafood consumption. Together, these indicators address the full scope of factors that effectively determine sustainability of fisheries management (equivalent to agricultural production), depicted in Table D4. The combined score of these indicators comprise the Production Method score for a given seafood product. Fish and seafood on the Seafood Watch "Avoid" list were arbitrarily assigned the value of -1 to signal sustainability concerns associated with those products. See Table D5 for current Monterey Bay seafood guidelines in a geographic context.

Table D4. Fish & Seafood Production Method Scoring

Production Management Score (PM)	Monterey Bay Seafood Watch Lists	Third Party Certifications
3	"Best Choice" list	Marine Stewardship Council (MSC)™
1	"Good Alternatives" list	Dolphin-safe™/Friendly™ (Tuna) 3rd-party contaminant-free labels (various)
-1	Seafood Watch "Avoid" list	None

29 Monterey Bay Aquarium: Seafood Watch Program. Accessed 4/21/2009.

Table D5. Seafood Watch Lists from Monterey Bay Aquarium by Region.

Fisheries Region	Best Choice*	Good Alternative
Virginia and the Carolinas Coasts	None	Atlantic Herring Crab, Blue Shrimp (farmed or wild-caught) Snapper, Grey, Lane, Mutton, or Yellowtail Squid Swordfish Tilefish, Golden Tuna, Bigeye Wahoo
Western Atlantic, Great Lakes, and Gulf/Caribbean Sea	Arctic Char **Catfish*** **Clams*** **Crab, Stone/Rock** Crayfish* (US) Freshwater Mussels* **Croaker, Atlantic** **Mahi Mahi** **Mullet, Striped** **Mussels*** **Oysters*** Perch, Yellow (Great Lakes) Prawns **Scallops, Bay*** **Bass, striped** **Sturgeon*** **Tilapia*** **Trout, Rainbow** **Tuna, Skipjack or Yellowtail** Whitefish, Lake (trap-net) **Wreckfish**	
Pacific Coast[30]	Cod, Pacific Crab, Dungeness Halibut, Pacific Pollock (Alaska caught) Salmon (Alaska wild-caught) Sardines (US Pacific) Tuna, Albacore (British Columbia/US Troll or Pole)	

*Species in bold are caught or raised (not exclusively) off southern Atlantic seaboard and eastern Gulf Coast. A species name followed by an asterisk specifies farmed only.

[30] Requires additional certification for "sustainable" status.

The Purchasing Geography Score: Evaluating the Proximity of Food Suppliers to Campus

The Purchasing Geography (PG) score circumscribes a variety of issues ranging from greenhouse gas emissions resulting from transport to food security and local food culture. Unfortunately, it is next to impossible to calculate a precise number of miles a given food product (or food product ingredients) has traveled from the farm(s) and fisheries they were produced on through various processing and distribution channels to the Warren Wilson College campus. Instead, a geographic hierarchy presented in Table D6 is used to prioritize purchasing from sources close to campus. It should in no way be interpreted that this scoring hierarchy is an exact measurement tool for determining fossil fuel emissions arising from transport. It merely indicates the relative distance a food has traveled from its supplier (which may or may not be an actual farm) to campus. Even campus produced beef travels hundreds of miles to off-campus processing despite its status in this scoring hierarchy as "local, <50 miles." However, it is safe to assume that the *closest possible* processing facilities are being utilized in these cases, making the score useful as an indicator of food miles associated with at least one link in the supply chain.

This Purchasing Geography (PG) score is derived from concentric circular geographic zones, the area of each is greater than the zones within by a factor of 10. The radius of this zone (with area = 10x) represents the average distance food travels from supplier to campus, and the maximum and minimum radii are set at $10^{x+0.5}$ and $10^{x-0.5}$, respectively. The exponent is adjusted to reflect the smallest practical zone and a decreasing scoring system (the PG score decreases as the exponent increases). This score can be conceptualized as orders of magnitude fewer food miles. Table D6 presents the six zones that define the Purchasing Geography score. Figure D2 illustrates this scoring hierarchy geographically and includes country breakdown and a map of the Appalachian Sustainable Agriculture Project (ASAP) Appalachian Grown™ region.

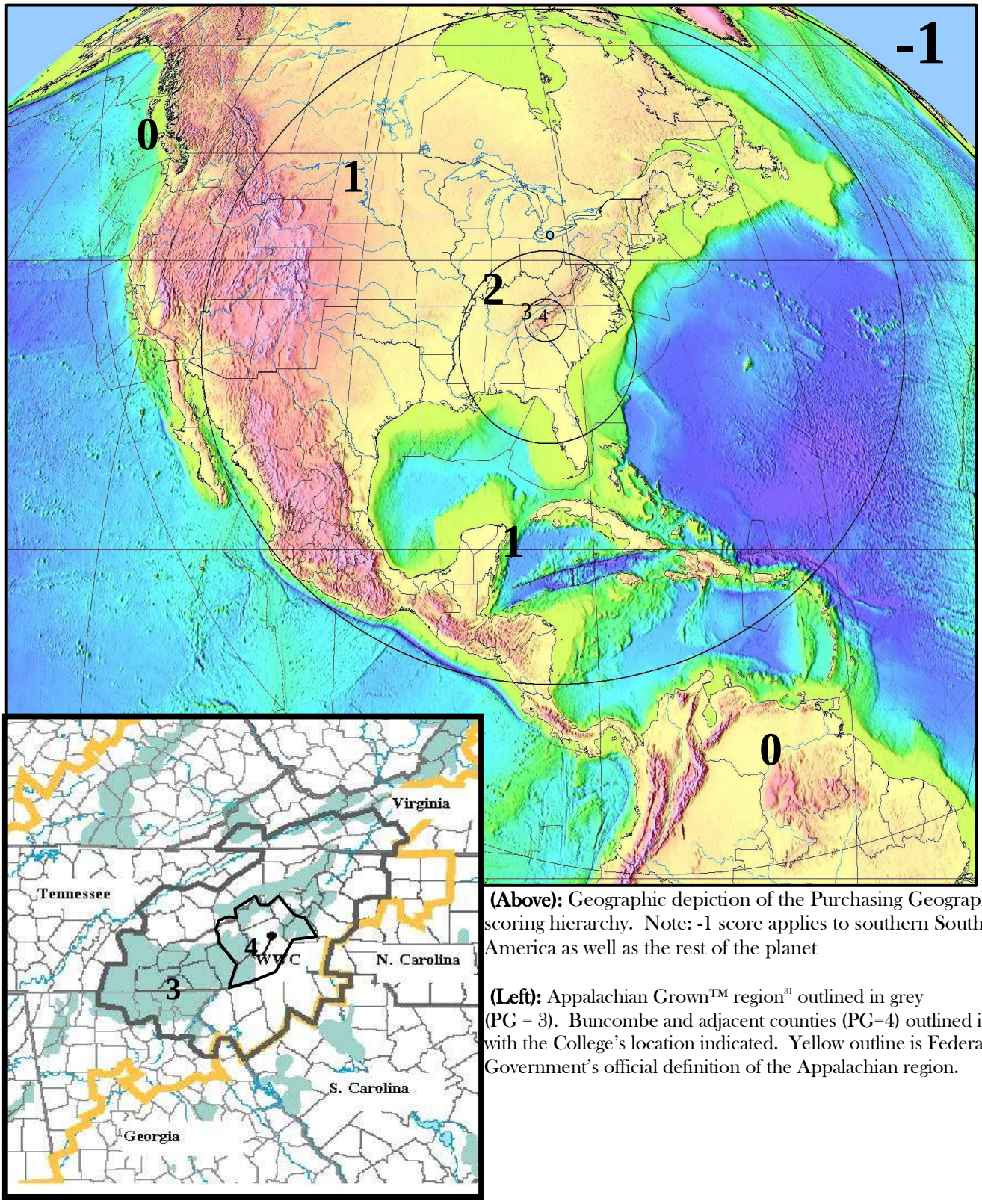
Table D6. Purchasing Geography Category Definitions

Score	Miles	Geographic Zone	States & Countries
4	<50 miles	Buncombe & adjacent counties	Buncombe, McDowell, Henderson, Madison, Haywood, and Transylvania counties of North Carolina
3	50-150 miles	Appalachian Grown	See Figure E2
2	150-500 miles	SE USA	US States: MS, AL, GA, FL, SC, NC, TN, IL, IN, OH, WV, VA, MD, DE
1	500-1500 miles	E. North America & Caribbean	US States: NM, CO, WY, SD, ND and all others east, Canadian Provinces: ON, PQ, NB, NS, PI Other Countries: Mexico, Honduras, Belize, Cuba, Jamaica, Haiti, Dom. Republic, Puerto Rico
0	1500-4000 miles	Rest of N. America and NW S. America	Rest of USA (excluding Hawaii), Rest of Canada Rest of Caribbean, Rest of Central America NW South America: Peru, Bolivia, Columbia, Venezuela, Guyana, Surinam, French Guiana, NW Brazil*, Others: Iceland, UK, Ireland, Portugal
-1	>4000 miles	Rest of World	Hawaii, Eurasia, Africa, Australia, Oceania

If a product contains a mix of products from more than one food miles zone, an average of the zones' scores should be used, weighting them based on the proportion of ingredients from each.

* Limited to rubber, tree nut & oils and other rain forest products; other products produced in Brazil are outside of 4000 mile radius

Figure D2. Map of Purchasing Geography Zones



(Above): Geographic depiction of the Purchasing Geography scoring hierarchy. Note: -1 score applies to southern South America as well as the rest of the planet

(Left): Appalachian Grown™ region[31] outlined in grey (PG = 3). Buncombe and adjacent counties (PG=4) outlined in black, with the College's location indicated. Yellow outline is Federal Government's official definition of the Appalachian region.

31 Appalachian Sustainable Agriculture Program (ASAP) verification program.

The Supply Chain Score: Evaluating the Producer's Share of the Food Dollar

The third sustainability characteristics, the Supply Chain (SC) score is needed to account for the sustainability concerns, in particular producer's share of the food dollars spent by the college that is associated with lengthened supply chains from producer to supplier. Supply chains (i.e. the flow of goods from farm to plate, and the contractual arrangements which support this) can vary greatly in their complexity. Strictly in term of the flow of goods, supply chains can be very complex or quite direct, with any of the routes or components depicted in Figure D3. There is a trend towards centralization in this process. Economies of scale and simplicity for the buyer have meant that one-stop food service companies are now dominating the market. As buying consortia become more common, and efficiencies and value for money more important, this trend may increase further. In parallel, competition from world markets has pushed commodity prices down. The result is a steady erosion of the business viability of smaller suppliers and processors.

Each of these procurement modes are explained in detail in Table D6. A Supply Chain (SC) score is assigned to each based on the natural log of the average share of the food dollar the producer receives[32]. Within the Sustainable Food Scoring System (SFSS), this score represents orders of magnitude of improvement toward Sustainable Food Policy objectives, reflecting exponentially increasing costs, lower nutritional quality, decreased food security, and overall uncertainty associated with longer supply chains. As such, this score is transformed from the natural logarithm to that of base 10 in the final scoring method to account for these multiple sustainability objectives.

Table D7: Procurement Mode Categories and Supply Chain (SC) Scores

Procurement Mode	**Description**	Avg. % of food dollar	Adjusted Log_n	Supply Chain (SC) Score
Campus	Self sufficiency in practice. Procurement from College Farm, Garden, or Forest crews.	150*	3.81	4
Direct	Procurement directly from primary producer (farm) or farmers' cooperative. The product, or all of its ingredients are produced by the supplier(s) and any processing activities are directed by the supplier(s). Close to 100% of the "food dollar" for these products makes it to the producer(s).	75	3.12	3
1 Stop	Procurement of products that the supplier procured directly from a farm or farmers' cooperative. On average, 50% of the "food dollar" for this type of procurement makes it to the producer(s), and the entire supply chain is simplified. The supplier knows where (and often how) the food was produced	30	2.20	2
Minimal Process	Procurement of minimally processed, whole foods that the supplier procured from a distributor unrelated to the producer.	12	1.10	1
Other	Products comprised entirely of secondary (or post-secondary) products. Generally, less than 10% of the "food dollar" makes it to the producer in this mode.	4	0.19	0

32 From Apaiah et al, *Quantitative Method for efficient food chain design* Trends in Food Science & Technology 16(2005) 204-215

* Set artificially high to prioritize WWC; reflects the increased consumer satisfaction associated with WWC-produced foods served by Dining Services

Putting it All Together: The Sustainable Food Score

The Sustainable Food Score is an expression of the totality of the three individual food sustainability characteristics – the production method score, plus the purchasing geography score, plus the supply chain score. The table below reports sustainability scores for all possible combinations of production methods, proximity and supply chain scores to illustrate the diversity of food characteristics that meet the minimum sustainability score of at least five.

Table D8: The Sustainable Food Scoring System* – All Possible Combinations of Production Method, Purchasing Geography and Supply Chain Scores.

3rd Party Certification	Food Alliance	Rainforest Alliance	Biodynamic	Fair Trade	Organic	Natural	Hum.+ G-F	Grass-fed	Prot. Hvst	Shade grown	Humane/ GMOfree	Basel	GMO
Production Score-->	**4.31**	**3.81**	**3.44**	**3.20**	**2.76**	**2.76**	**2.20**	**1.76**	**1.58**	**1.32**	**1.27**	**0**	**-1**
Geography Score: Local (FM=4)													
Campus	**38.80**	**34.29**	**30.98**	**28.79**	**24.88**	**24.88**	**19.83**	**15.88**	**14.2**	**11.8**	**11.4**	5.4	3.7
Direct	**21.55**	**19.05**	**17.21**	**15.99**	**13.82**	**13.82**	**11.01**	8.82	7.9	6.5	6.3	4.7	2.9
1 Stop	**12.93**	**11.43**	**10.33**	9.60	8.29	8.29	6.61	5.29	4.7	3.9	3.8	3.9	2.1
Min. Process	8.621	7.62	6.88	6.40	5.53	5.53	4.41	3.53	3.1	2.6	2.5	3.1	1.4
Other	6.47	5.71	5.16	4.80	4.15	4.15	3.30	2.65	2.3	1.9	1.9	2.2	0.6
Geography Score: Appalachian Grown (FM=3)													
Direct	**12.93**	**11.43**	**10.33**	9.60	8.29	8.29	6.61	5.29	4.7	3.9	3.8	3.9	2.1
1 Stop	8.62	7.62	6.88	6.40	5.53	5.53	4.41	3.53	3.1	2.6	2.5	3.1	1.4
Min. Process	6.47	5.71	5.16	4.80	4.15	4.15	3.30	2.65	2.3	1.9	1.9	2.4	0.6
Other	5.39	4.76	4.30	4.00	3.46	3.46	2.75	2.20	1.9	1.6	1.5	1.4	-0.1
Geography Score: Southeast USA (FM=2)													
Direct	8.62	7.62	6.88	6.40	5.53	5.53	4.41	3.53	3.1	2.6	2.5	3.1	1.4
1 Stop	6.47	5.71	5.16	4.80	4.15	4.15	3.30	2.65	2.3	1.9	1.9	2.4	0.6
Min. Process	5.39	4.76	4.30	4.00	3.46	3.46	2.75	2.20	1.9	1.6	1.5	1.6	-0.1
Other	4.31	3.81	3.44	3.20	2.76	2.76	2.20	1.76	1.5	1.3	1.2	0.7	-0.8
Geography Score: Eastern North America and Caribbean(FM=1)													
Direct	6.47	5.71	5.16	4.80	4.15	4.15	3.30	2.65	2.3	1.9	1.9	2.4	0.6
1 Stop	5.39	4.76	4.30	4.00	3.46	3.46	2.75	2.20	1.9	1.6	1.5	1.6	-0.1
Min. Process	4.31	3.81	3.44	3.20	2.76	2.76	2.20	1.76	1.5	1.3	1.2	0.8	-0.8
Other	3.23	2.86	2.58	2.40	2.07	2.07	1.65	1.32	1.1	0.9	0.9	-0.04	-1.6
Geography Score: Rest of N.America & Northern S.America (FM=0)													
Direct	5.39	4.76	4.30	4.00	3.46	3.46	2.75	2.20	1.9	1.6	1.5	1.4	-0.1
1 Stop	4.31	3.81	3.44	3.20	2.76	2.76	2.20	1.76	1.5	1.3	1.2	0.7	-0.8
Min. Process	3.23	2.86	2.58	2.40	2.07	2.07	1.65	1.32	1.1	0.9	0.9	-0.0	-1.6
Other	2.16	1.90	1.72	1.60	1.38	1.38	1.10	0.88	0.7	0.6	0.6	-0.9	-2.4
Geography Score: Global (FM = -1)													
Direct	4.31	3.81	3.44	3.20	2.76	2.76	2.20	1.76	1.5	1.3	1.2	-0.1	-1.0
1 Stop	3.23	2.86	2.58	2.40	2.07	2.07	1.65	1.32	1.1	0.9	0.9	-0.8	-1.8
Min. Process	2.16	1.90	1.72	1.60	1.38	1.38	1.10	0.88	0.7	0.6	0.6	-1.6	-2.5
Other	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.0	0.0	-2.4	-3.3

*Highlighted cells indicate the combination of characteristics meets the Sustainable Food minimum standard of 5, some only with rounding up.

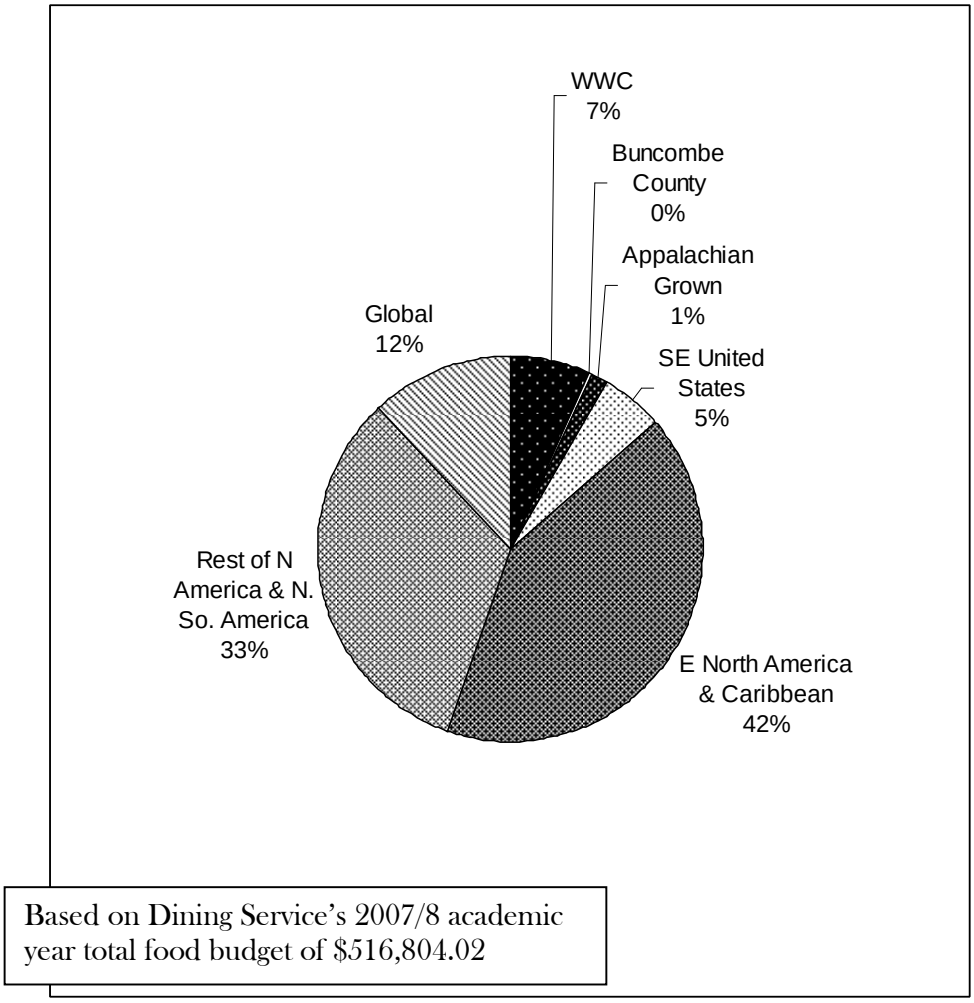
Testing the Sustainable Food Scoring System

The Local Food Crew tested the Sustainable Food Score methodology using Dining Services food purchasing data from the 2007/8 academic year. Total food *Purchasing Geography* and the proportion of total food purchases that meet the minimum sustainability standard are reported in Figures D3 and D4.

The Local Food Crew were also able to characterize total food purchases into 10 specific food groups, calculate sustainable food scores for each group and determine the proportion of purchases in each food group meeting the minimum sustainability standard. Using the specific food group data, the Local Food Crew prepared a simple projection of the annual percent increase in sustainable food procurement necessary to meet the 2020 purchasing goals of this policy. These purchasing goals, developed by the Local Foods Crew in consultation with Brian O'Loughlin, WWC Dining Manager and Peter Marks, Director of the ASAP Local Food Campaign[33], represent a credible and practical increase in sustainable purchasing based on current and expected near term increases in local food production capacity in each specific food group and the current increased costs associated with local and sustainable food purchases.

The results of this analysis are reported in Figures D3 through D6 and Table D6. These figures clearly demonstrate the utility of the sustainable food scoring system developed for this policy.

Figure D3. Total Food Purchasing Geography (2007/8 Academic Year)



[33] ASAP Local Food Campaign.

Figure D4. Sustainable Food Purchasing Geography (2007/8 Academic Year)

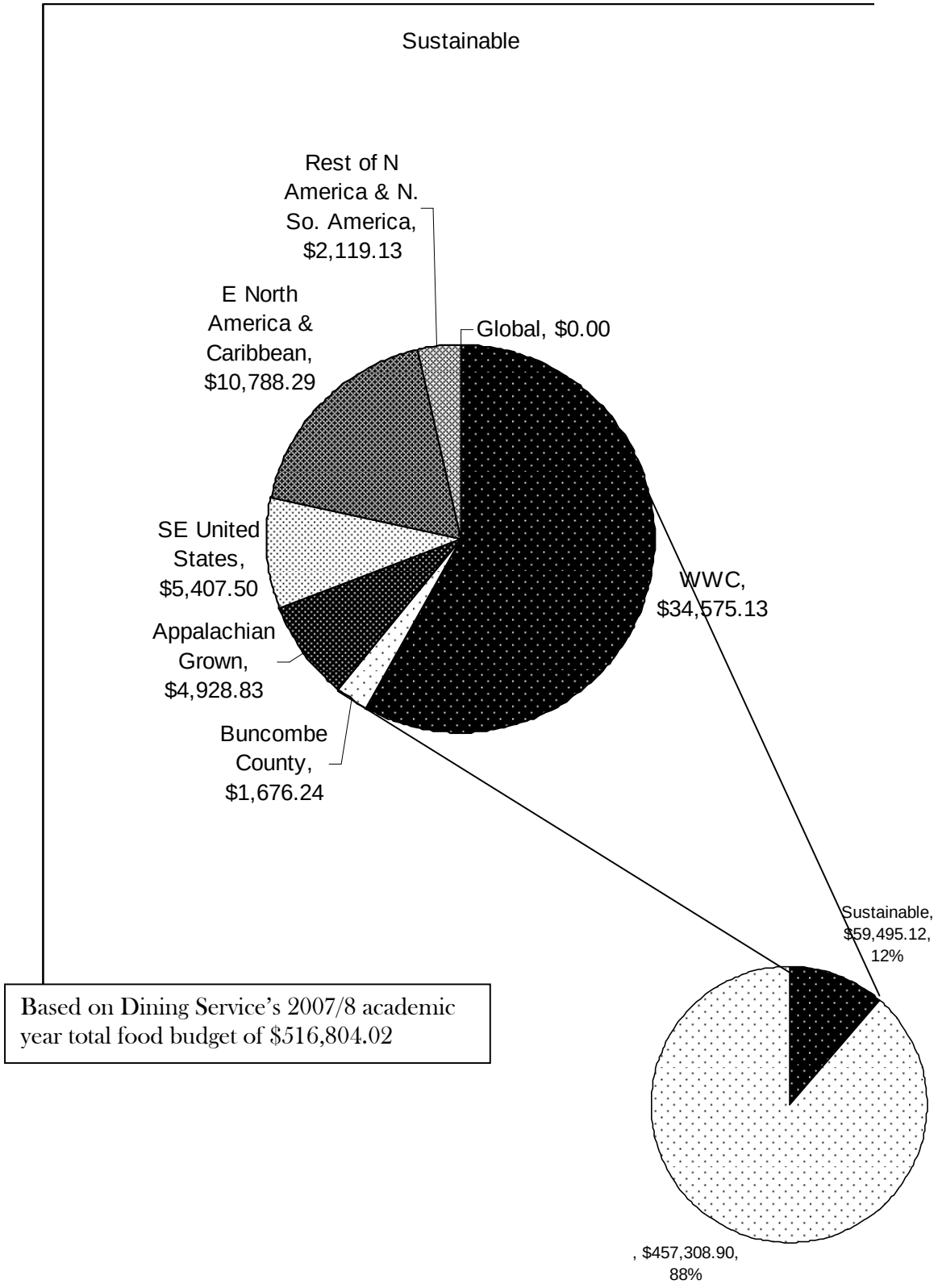


Figure D5. Food Purchasing by Category, 2007/8 Academic Year

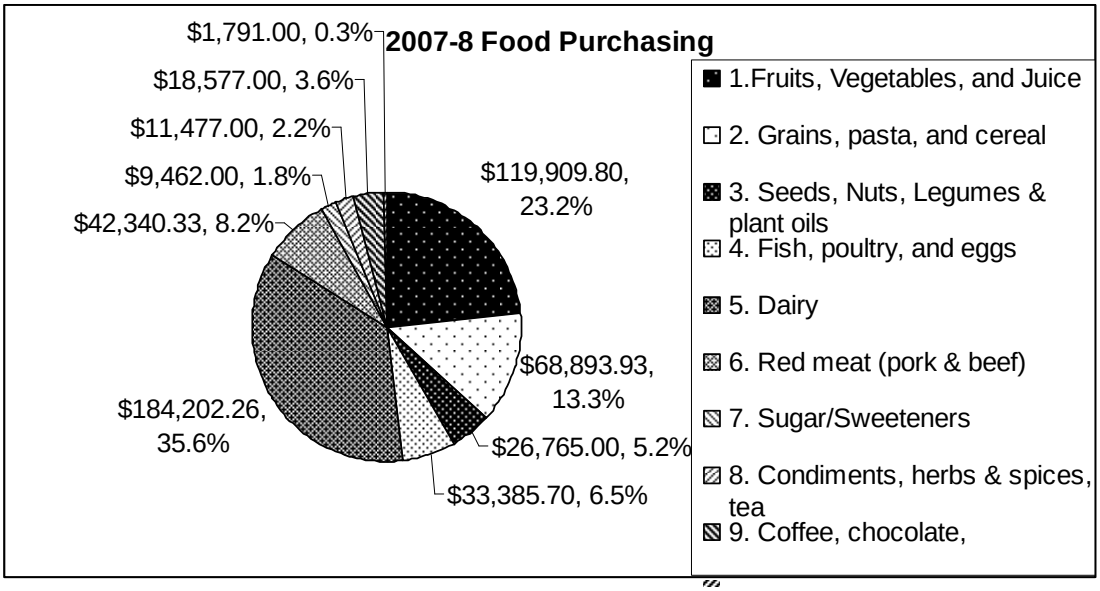
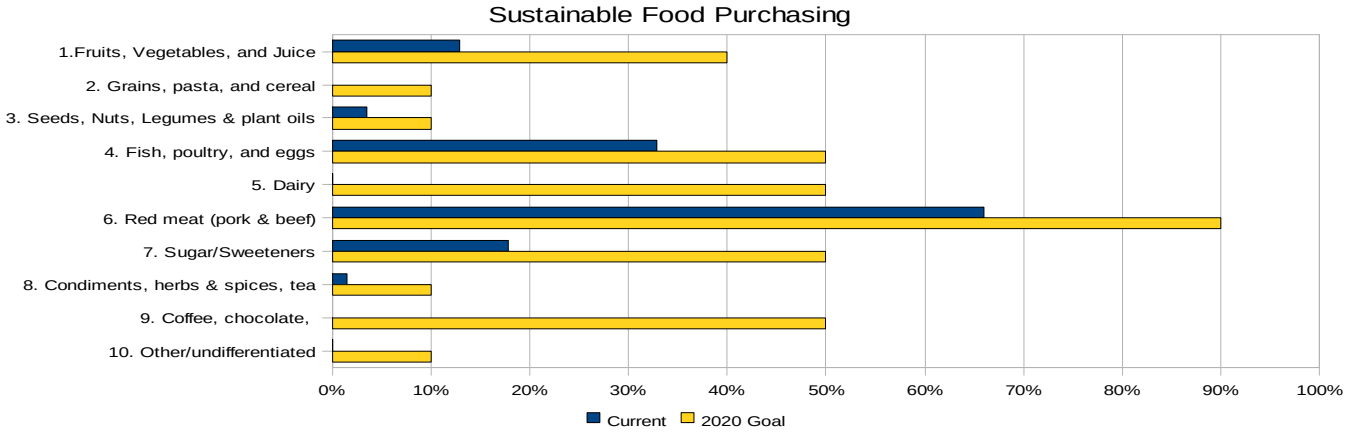


Table D9. Sustainable Food Purchasing Disaggregated by Food Groups: 2007/8 Patterns & 2020 Goals in 2008 Dollars.

	% Sustainable Current	%Budget Current	% Sustainable 2020 Goal	% Budget 2020 Goal	Avg annual increase to reach 2020 goals (%)	Annual increase ($)
1.Fruits, Vegetables, and Juice	12.9%	3.00%	40%	9.31%	2.5%	$2,954.14
2. Grains, pasta, and cereal	0.0%	0.00%	*10%*	1.34%	0.9%	$626.31
3. Seeds, Nuts, Legumes & plant oils	3.5%	0.18%	*10%*	0.52%	0.6%	$158.16
4. Fish, poultry, and eggs	32.9%	2.13%	50%	3.24%	1.6%	$519.00
5. Dairy	0.1%	0.04%	50%	17.88%	4.5%	$8,356.11
6. Red meat (pork & beef)	66.0%	5.43%	90%	7.40%	2.2%	$923.79
7. Sugar/Sweeteners	17.9%	0.26%	50%	0.72%	2.9%	$217.75
8. Condiments, herbs & spices, tea	1.5%	0.04%	*10%*	0.28%	0.8%	$111.84
9. Coffee, chocolate,	0.0%	0.00%	50%	0.64%	4.5%	$298.95
10. Other/undifferentiated	0.1%	0.00%	*10%*	0.22%	0.9%	$100.29
Totals		**11.08%**		**41.56%**	**2.8%**	**$14,266.34**

Figure D6. Current Purchasing Patterns (2007/8) and 2020 Sustainable Purchasing Goals in 2020*



* Purchases reported as percent of the total food purchasing budget in 2007/8 and 2020. This is a graphical representation of the data presented in Table D9.

Appendix E: Food System Resilience

The concept of resilience is central to the successful management of complex systems for sustainability. Resilience is the capacity of a system (such as a food system or a college campus community) to absorb disturbance and reorganize while undergoing change, so as to retain essentially the same function, structure, and identity.[34] Resilience is a required condition of, but distinctly different from, sustainability. The concept of resilience shifts sustainable development strategies *from* those that aspire to control change in systems assumed to be stable, *to* those that promote the capacity of social-ecological systems to cope with, adapt to, and shape change. Managing for resilience enhances the likelihood of sustaining healthy community structure and function in changing environments where the future is unpredictable and surprise is likely.

This section illustrates relationships among agricultural production and WWC campus population over the past century. Total production is reduced by a factor of 1000 to bring it to scale with the others. Particular emphasis is on the past 35-40 years, before which information was sparse and, potentially, less accurate.

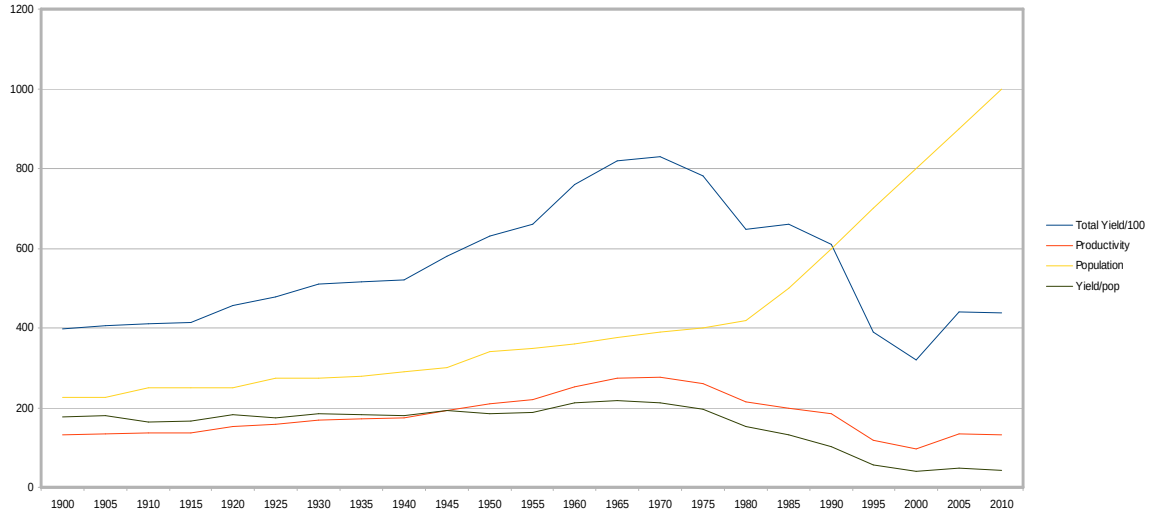


Figure E1. WWC population and agricultural productivity since 1900[35]. Reductions in total yield since 1970 have resulted from the discontinuation of the College's licensed dairy and butchery in the late 1970s and early 1980s, and moves away from unsustainable farming practices (heavy use of chemical inputs, silage production, and crop cultivation on steep slopes) in the 1990s. Increases in production since 2000 have arisen primarily from streamlining overall production systems and steadily increasing output of garden produce. Units on the x-axis are lbs (for productivity and yields) and number of students & faculty (population).

34 Resilience and Sustainable Development: Building Adaptive Capacity in a World of Transformations, WSSD, 2002.

35 Data extrapolated from WWC archives and historical records by Local Foods Crew, Fall 2009.

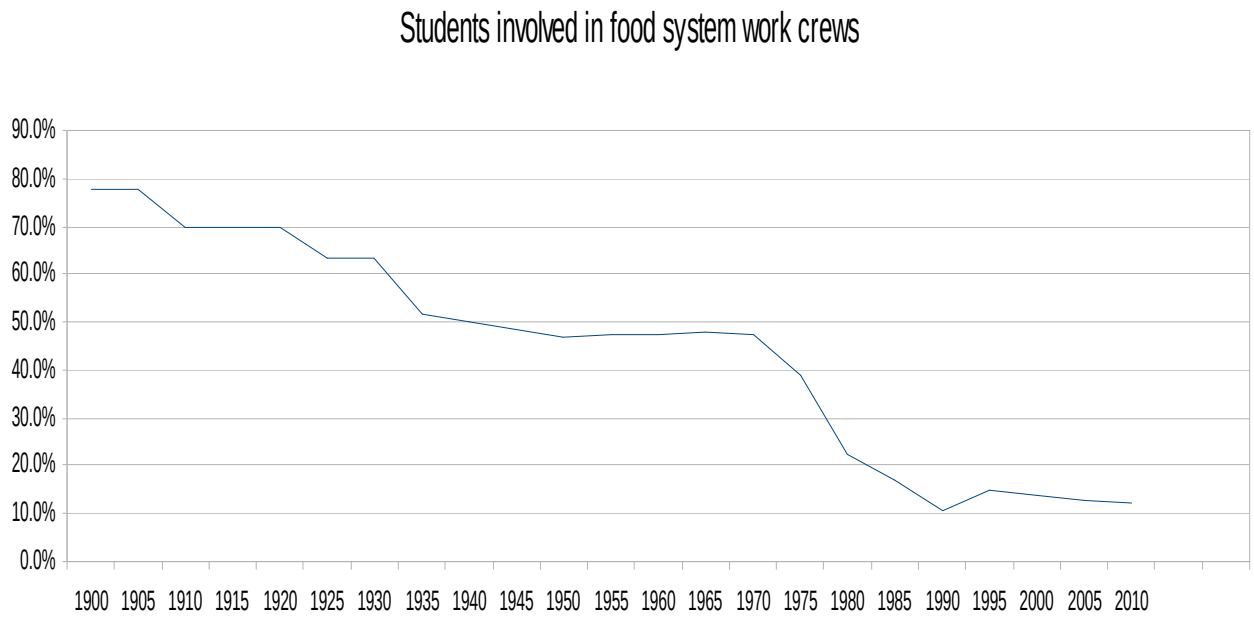


Figure E2. Proportion of students involved directly in WWC food systems since 1900[36]. The sharp decline around 1930-1935 represents the change from Asheville Farm School to Warren Wilson College. Other steep declines in the 1970s and '80s indicate the period when WWC transitioned from in-house catering to contracted providers, discontinued its butchery and phased out the once-prominent dairy operation. Increases in the early 1990's are due to the creation of Cow Pie Cafeteria and the Garden work crew, but further increases in campus population have all but negated these gains sin

Appendix F. Monitoring Food System Sustainability

This policy takes an adaptive approach to the development of a sustainable campus food system. This approach recognizes the complexity of managing a food system for sustainability. Sustainability goals will change over time as a result of changes in a multitude of economic, environmental and social factors within and outside of the campus community. Regular monitoring and evaluation of the campus food system to evaluate progress towards sustainability goals, and regular revision of the policy goals will be critical to the success of this policy.

Table E1 on the next page presents a plan, organized according to policy goals, for the comprehensive monitoring and assessment of campus dining services using recommended sustainability indicators. The table includes source citations for each indicator and the WWC party responsible for gathering and reporting the data needed to evaluate each indicator.

[36] Data extrapolated from WWC archives and historical records by Local Foods Crew, Fall 2009.

Table F1. Monitoring Food System Sustainability with Indicators

Goals Objectives	Indicators	Source*	Data sources
Goal 1: Develop Sustainable Supply Chain Management			
1 Encourage/ensure socio-ecological sustainability of production/supply	A) Percentage of food budget spent on 3rd-party certified products B) Campus budget on food products	DEFRA UBC	Local Foods Crew (LFC) Sustainable Food Audit (SFA)
2. Reduce/minimize "food miles" & support local/regional economy	A) Total miles traveled from farm to WWC of selected food groups (FM score) B) Ratio of local (Appalachian Grown or closer) vs. non-local sources	DEFRA H&K	A) LFC - SFA B) LFC
3.Increase producer share of "food dollar"	A) Total $ direct procurement (1° and 0°) B) Affordability of local food (change over time in local food prices relative to global)	DEFRA UBC	Food purchasing records (DS), US price data
Goal 2: Reduce Adverse Environmental Impacts of Food Systems Operations			
4. Reduce consumption of energy & nonrenewable resources	A) Energy use (kJ, fossil fuel expenditures)	DEFRA	A) WEE Crew,
5. Reduce production and export of waste and pollution	A) Food waste (pre- & post-consumer) & packaging waste produced B) Percentage of food lost to spoilage & mishandling C) Output to landfill D) Greenhouse gas emissions (includes 4A)	CAP H&K H&K DEFRA	A WWC composting program, Recyc. crew, B DS managers C Recycling crew D FM score, # food deliveries/week
Goal 3: Optimize resilience			
6. Increase consumption of WWC-produced foods	A) Agricultural productivity (per capita) B) Sales to WWC Dining Services* C) Capital investment in campus food systems	H&K DEFRA DEFRA	All 3: WWC Farm & Garden managers;
7. Increase student involvement in campus food systems	A) Proportion of student work program directly involved in food systems	DEFRA	Work Program
Goal 4: Provide ongoing sustainability education for students, guests, and employees			
8. Integrate WWC food systems sustainability initiatives into wider triad of academics, work, & service, plus student/guest/staff awareness	• Student attitude toward equity, quality, variety, seasonality, and price of food • Awards/honors of WWC food systems	UBC	LFC - Student surveys
Goal 5: Develop partnerships among WWC entities and others to develop sustainability initiatives and promote shared learning and cooperation.			
9. Promote synergy among local sustainability initiatives	Perceptions of sustainability initiatives' leadership External partnerships around food systems	LFTF	Interviews with ASAP representative(s)
10. Provide tours, information, and presentations to NACUFS/industry	Number of tours, information packets, & presentations given	LFTF	LFC

* Source of indicators identified as follows: DEFRA: DEFRA (UK) Sustainable Farming and Food Strategy Indicators. Accessed November, 2009, H&K: Life Cycle Based Sustainability Indicators for Assessment of the US Food System, Heller and Keoleian, 2000, UBC: University of British Columbia (UBC), Biting into Sustainability, 2002, CAP: Warren Wilson College Climate Action Plan, 2009. LFTF: WWC Local Foods Task Force.