Undergraduate Curricula in Agribusiness and Agricultural Economics: What's the Difference?

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The Department of Agricultural and Applied Economics, Clemson University, carries out periodic reviews of its undergraduate curricula. As part of the current review, the authors were charged with the task of evaluating the Department's Agricultural Economics curriculum, especially its Agricultural Business emphasis area. In carrying out our assignment, we decided that we should compare our curriculum requirements to those of other undergraduate programs across the country. In our search of the literature, we did find several studies that have compared agribusiness and/or agricultural economics curricula at selected institutions. However, these studies are dated, provide only limited details about the curricular requirements, and/or cover only a limited number of institutions with agribusiness programs.

Carmen and Pick surveyed agricultural economics departments in 1985 in order to determine the departments' credit hour requirements for undergraduate agricultural economics and agribusiness degrees. Their sample was comprised of 24 departments with both agricultural economics and agribusiness programs, 11 departments with only an agribusiness program, and 20 departments with only an agricultural economics program. Carmen and Pick report the average number of credit hours in 12 categories: (1) writing; (2) oral communications; (3) computer science; (4) calculus; (5) intermediate microeconomics; (6) intermediate microeconomics; (7) accounting; (8) statistics; (9) natural science; (10) social science and humanities; (11) agriculture; and (12) agricultural economics.

Franklin surveyed 81 agricultural economics departments in the United States and Canada in 1985 in order to determine the course requirements of their undergraduate curricula. Usable responses were received from 43 departments. Of these, 37 offered an agribusiness major/option and 27 offered an agricultural economics major/option. Franklin reports the number of departments requiring calculus, statistics, computer, and selected agricultural economics and economics courses under each curriculum.

Larson used college bulletins for 43 institutions from 1994-1996 to determine the courses required for the institutions' agribusiness majors. He reports the percentage of required course credits in six categories (1) math, statistics, and computer; (2) written and oral communication, (3) humanities, social science, and international; (4) agricultural economics, economics, and business; (5) technical agriculture; and (6) science.

This paper builds upon this literature in several ways. First, we provide current information on both agribusiness and agricultural economics curricula. Second, the previous studies have focused on the "major" institutions that offer agribusiness and/or agricultural economics programs. We summarize curricula information for 112 of the 114 US institutions that offer these programs. Third, previous studies have typically combined courses into only a few categories. We summarize curricula information at a lower level of course aggregation.

Data and Methods

We used the Integrated Postsecondary Education Data System College Opportunities On-Line (IPEDS COOL) database of the National Center for Educational Statistics, United States Department of Education, to identify US institutions that offer baccalaureate programs in "Agricultural Business and Production." There are 166 such institutions (126 public, 40 private) in the IPEDS COOL database. Based on access to the Internet sites of these 166 institutions, we determined that:

- 114 institutions offer baccalaureate majors or study/concentration areas in agribusiness and/or agricultural economics;

- 105 offer an agribusiness (or similar) major or study/concentration area;

- 34 offer an agricultural economics (or similar) major or study/concentration area;

- 29 (mainly 1862 and 1890 universities) offer a major or study/concentration area in both agribusiness and agricultural economics; and

- 11 institutions offer a combined agribusiness/agricultural economics major or study/concentration area.

We recorded the courses in selected areas (i.e., math, statistics, and computer science/applications; economics; agricultural economics; agribusiness; agriculture) and associated credit hours required for the agribusiness and/or agricultural economics majors (or study/concentration areas) at 112 of the 114 the institutions offering those programs.[1,2]

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[1] Most of the curricula information was obtained from online versions of the institutions' college bulletins. When multiple editions of a bulletin were available online, we used the most recent, usually for the 2001-2002 school year. Online information is incomplete for several of the institutions. Where possible, we have supplemented the online information with data obtained via personal communications with faculty at those institutions. At this time, the data for two institutions with agribusiness programs remain incomplete. We converted quarter hour credits to a semester credit hour (SCH) basis by multiplying the quarter hours by 2/3.
[2] We ignored one-hour freshman orientation courses.

Some institutions offer multiple agribusiness (or similar) programs. For example, students at the University of Nebraska – Lincoln can major in agribusiness through either the College of Agricultural Sciences and Natural Resources or the College of Business Administration. Because the degree requirements differ between the two, we treated each as a separate program. Cornell University's Department of Applied Economics and Management offers a major in Applied Economics and Management that allows students to select from six specializations, including business, food industry management, and agribusiness management. We counted these three specializations as separate agribusiness programs. We ended up with data for 108 undergraduate agribusiness programs.

Many institutions that offer agricultural economics programs allow students to choose from among alternative study/specialization areas, including agribusiness. In identifying the requirements for agricultural economics curricula other than agribusiness, we selected the most general study/specialization area, if available. For example, Agricultural and Resource Economics majors at the University of Arizona choose either an agricultural economics, agribusiness management, or resource and environmental economics option. In this case, we treated the agribusiness management option as an agribusiness program and the agricultural economics option as an agricultural economics program. When an institution did not offer a "general" agricultural economics option, we selected the option/options closest to "traditional" agricultural economics areas such as farm/ranch management, finance, marketing, etc.; and omitted "less traditional" areas such as natural resource/environmental economics. For example, Texas A& M university offers both agribusiness and agricultural economics majors. Within agricultural economics, students choose from farm/ranch management, food/fiber marketing, and resource economics specializations. We combined the farm/ranch management and food/fiber marketing options by "averaging" their respective requirements. To illustrate, the farm/ranch management option requires a 4.0 credit soils course not required in the food/fiber marketing option, while the food/fiber option requires a 3.0 credit introductory business marketing course not required by the farm/ranch management option. We assigned 2.0 credits to soils and 1.5 credits to introductory business marketing as course requirements within the agricultural economics program.

Eleven institutions offer a total of 12 programs that "combine" agricultural economics and agribusiness. Examples are Agribusiness and Applied Economics at the Ohio State University and Agricultural Economics and Business at the University of Tennessee. Rutgers Univer-

sity offers programs in business economics and food industry economics that we counted as separate "combined" programs.

Many agribusiness/agricultural economics programs allow students to choose from a list of courses in meeting degree requirements. In these cases, we assumed that each course is equally likely to be chosen. For example, if students are allowed to choose from a three-credit course in managerial economics and a four-credit course in intermediate microeconomics, we assigned 1.5 credits to managerial economics and two credits to intermediate microeconomics.[3]

Courses at some institutions combine subject material that is covered in separate courses at most institutions. In these cases, we allocated the credit hours to individual courses. For example, several institutions offer courses in "Agricultural Management," which according to their course descriptions cover both farm and agribusiness management. We divided the credit hours for these courses evenly between agribusiness and farm management courses.

We combined courses from agricultural economics and economics that focus on economic theory. For example, many Agricultural Economics Departments offer introductory agricultural economics courses that apply microeconomic principles to agricultural problems. We combined these courses with the microeconomics principles courses typically offered by Economics Departments.

Results and Discussion

We grouped the course requirements into the 59 categories shown in Tables 1 and 2. Table 1 provides summary statistics for the 108 agribusiness, 34 agricultural economics, and 12 combined agribusiness and agricultural economics programs for which the course requirement data are available. Due to space limitations, we discuss only selected course requirements.

On average, the agricultural economics programs require 1.2 SCHs more of both calculus and statistics/probability/econometrics than do the agribusiness programs. Among the agribusiness programs, 56 (52%) require at least one calculus course, 16 (15%) allow students to choose a calculus course from a list of courses (usually other math courses), and 36 (33%) do not require a calculus course. The percentage of agribusiness programs without a calculus requirement from this study is lower than the percentages reported by Carmen and Pick (37%) and Franklin (38%). Among the agricultural economics programs, 29 (85%) require at least one calculus course, 3

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[3] In contrast, Larson made assumptions regarding which course(s) students would be most likely to take. As an example, he used the case of a program in which students are allowed to choose between an advanced calculus course and a technical agriculture course. He assumed that the students would choose a technical agriculture course.

(9%) require students to choose from a list of courses containing at least one calculus course, and 2 (6%) do not require a calculus course. The percentages of agricultural economics programs without a calculus requirement reported in previous studies are 11% from Carmen and Pick, and 19% from Franklin. Thus, proportions of undergraduate agribusiness and agricultural economics programs without a calculus requirement appear to have decreased over time. Also, the average SCHs for calculus from the Carmen and Pick sample, 2.58 for agribusiness and 3.41 for agricultural economics, are lower than the corresponding averages from the current study.

All of the agricultural economics programs and 86% of the agribusiness programs either require at least one statistics/probability/econometrics course or require students to choose from a listing of courses containing one or more statistics/probability/econometrics courses. Carmen and Pick reported that 98% of the agricultural economics programs and 81% of the agribusiness programs in their sample required a statistics course. In Franklin's sample, 89% of the agricultural economics programs and 89% of the agribusiness programs required a statistics course. The current average SCHs for statistics/probability/econometrics courses are higher than those reported by Carmen and Pick, 3.13 for agribusiness and 3.55 for agricultural economics.

Together, the math/statistics/computer courses account for 9.8% of the agribusiness program requirements and 11.9% of the agricultural economics program requirements. Larson found that these courses accounted for 11.9% of the agribusiness program requirements for the schools included in his sample.

In the Carmen and Pick sample, agribusiness programs required an average of 2.44 SCHs of intermediate microeconomic theory and 1.87 SCHs of intermediate macroeconomic theory, while agricultural economics programs required an average of 2.81 SCHs of intermediate microeconomic theory and 2.43 SCHs of intermediate macroeconomic theory. While there have been apparent modest decreases in the average SCHs for the intermediate theory courses in agricultural economics programs, the average intermediate microeconomics and macroeconomics SCH requirements in agribusiness programs have decreased by 46% and 59%, respectively, relative to the Carmen and Pick sample.

Carmen and Pick were concerned by the relative lack of emphasis given to intermediate macroeconomics by the agribusiness programs in their sample. They note (p. 142) that "(s)tudents who obtain jobs with agricultural business firms are required to deal with macroeconomic topics such as interest rates, level of growth, taxation, consumption, national income,

money supply, etc. on a daily basis." In a similar vein, Etheridge (p. 6), says that agribusiness programs should "… not emulate the business schools too closely in the sense that many of them have eliminated much of the economic theory and understanding of analytical techniques from their programs …. We should, I propose, retain the conceptual and analytical focus in our agribusiness educational programs."[4] Apparently, the agribusiness curriculum committees at most institutions do not share these sentiments.

The average total required SCHs of "traditional" agricultural economics and agribusiness courses are similar for the two program types: 18.46 SCHs for agribusiness programs and 18.87 for agricultural economics programs. Among specific "traditional" agricultural economics courses, the average requirements for agribusiness and agricultural economics programs differ by more than ±1.0 SCH only for finance and natural resource/environmental/land economics. However, agricultural economics students are required to take an average of 1.85 SCHs more agricultural economics electives than are agribusiness students. Among the agribusiness courses, only agribusiness/food industry management has an average SCH requirement that differs by more than ±1.0 SCH between agribusiness and agricultural economics programs.

On average, agribusiness programs require 6.06 SCHs more of general business courses than do agricultural economics programs. The largest average differences in SCHs between agribusiness and agricultural economics program requirements are for management (1.46 SCHs), marketing (1.34 SCHs), and accounting (1.32 SCHs). Seven of the agribusiness programs do not have a business school accounting requirement; however, four of these seven programs have a farm business analysis/records/accounting requirement. The average accounting SCH requirements for both programs in the current study are lower than the corresponding program requirements in the Carmen and Pick sample, 5.96 SCHs for agribusiness programs and 4.49 SCHs for agricultural economics programs.

Notice that agribusiness students are required, on average, to take less than 1.0 SCH of human resource/organizational behavior coursework, whether in agricultural economics or in the business school.[5] Only one agribusiness program requires a human resource/organizational behavior course taught within agricultural economics/agribusiness, and only 21 require at least one

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[4] Whether business schools are giving less emphasis to economic theory is a moot point. Biere (p. 1058) says that "(b)usiness schools are placing more emphasis on economics."
[5] Although most human resource/organizational behavior courses are taught in the business school, we maintained separate categories under the agribusiness and general business headings because of our personal interest in developing such a course in our Department.

such course taught within the business school. Litzenberg and Schneider conducted the Agribusiness Management Aptitude and Skill Survey (AGRIMASS) of agribusiness managers in order to determine the knowledge, skills, and abilities (KSAs) that agribusiness firms require of their employees. The survey respondents ranked interpersonal KSAs emphasized in human resource/organizational behavior courses (e.g., work with others/team player, delegate responsibility and authority, select and supervise employees) higher than business, economics, technical, and quantitative KSAs. The Agribusiness Education Evaluation Survey (AEES) asked agribusiness leaders to recommend whether more, less, or the same course requirements were needed in 14 subject matter areas (Downey). More of the leaders (63%) recommended increasing human relations course requirements than any other subject matter area. Previous studies do not provide any information as to human resource/relations requirements of agribusiness programs, so we cannot say whether those requirements have increased over time. However, if those requirements have increased over time, they have not increased much. In our opinion, agribusiness majors and their prospective employers would benefit from an increased emphasis on human resource/relations coursework.

There is a wider range in the technical agriculture course requirements than in any other course category, regardless of program type. The range is 0.0 to 43.0 SCHs for agribusiness programs, and 0.0 to 22 SCHs for agricultural economics programs. The Carmen and Pick survey indicated that agribusiness programs required an average of 12.79 SCHs of agriculture courses, and agricultural economics programs required an average of 11.10 SCHs of those courses. The corresponding current averages are lower, but not dramatically so. Agriculture courses accounted for an average of 9.0% of the SCH requirements for agribusiness programs in the Larson survey. Those courses now account for 9.69% of the agribusiness SCH requirements.

Of the 74 employee characteristics included in the AGRIMASS, managers ranked high moral/ethical standards third and leadership seventh in terms of their relative importance to agribusiness firms (Litzenberg and Schneider). However, few agribusiness and agricultural economics curricula include leadership and ethics courses. Among the agribusiness programs, eight require a leadership course, and another six require students to choose from a listing of courses containing a leadership course. Only two of the agricultural economics programs require a leadership course. Only seven of the agribusiness programs either require an ethics course or require

students to choose from a list that contains such a course; only one agricultural economics program has an ethics requirement.

On average, students in agribusiness programs take 1.20 SCHs more in law courses (e.g., business law, legal environment of business, agricultural law, etc.) than do students in agricultural economics programs. Among agribusiness programs, only 31% do not have a law requirement, while 65% of the agricultural economics programs do not have such a requirement.

We included the "Communications" courses because of our interest in "communication across the curriculum" issues. This category includes only those communications courses taught outside English/Speech/Communications (or similar) Departments. Virtually all institutions include communications courses, usually from English/Speech/Communications (or similar) Departments, among their general education requirements. Thus, the "Communications" hours reported here understate the communications course requirements of the various majors.[6] Examples of courses we included are "Managerial Communication," a three-hour business school course required of agribusiness majors at Texas Tech University; "Writing in Resource Economics," a three-hour Department of Resource Economics course required of all of that Department's majors at the University of Massachusetts; and "Agri-Media Skills," a three-hour agricultural education course required of agribusiness majors at Middle Tennessee State University. Among agribusiness programs, 16 require a "Communications" course, and another five require students to choose from a listing that includes a "Communications" course. Three of the agricultural economics programs require a "Communications" course and another requires students to choose from a listing that includes such a course.

Respondents ranked previous work experience via an internship/cooperative work study 51st in relative importance in the AGRIMASS (Litzenberg and Schneider). However, our informal contacts with agribusiness recruiters and campus placement staff indicate that an increasing number of agribusiness firms are using internships and/or cooperative work studies to screen prospective employees. Only 22% of the agribusiness programs either have an internship/cooperative study/practicum requirement or allow students to choose from a listing that includes an internship/cooperative study/practicum. A few stress internships in their curricula. Examples of these programs and their internship/cooperative study/practicum requirements are:

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[6] Also, many institutions have communications requirements that can be met, at least in part, via subject-matter courses that include writing and/or speech communications components (e.g., a prices course labeled "writing intensive"). We did not attempt any allocation of the credit hours of such courses to the "Communications" category.

SUNY Cobbleskill, 15 SCHs; Nicholls State University (LA), 12 SCHs; and Rocky Mountain College (MT), 9 SCHs. For their sample, Carmen and Pick indicated that the proportion of students participating in internship programs was inversely related to the department's enrollment. We do not have enrollment data for the programs in our study; however, we suspect that internships/cooperative study/practicum SCH requirements decrease as the number of departmental majors increase.

As might be expected, the mean SCHs of the various course requirements for the programs that combine agribusiness and agricultural economics fall between the mean SCHs for the separate agribusiness and agricultural economics programs in most cases.

Table 2 provides summary statistics on required agribusiness and agricultural economics program SCHs for the 29 institutions that offer both programs. Specific courses for which these agribusiness programs require an average of 1.0 SCH or more than their agricultural economics program counterparts are finance, agribusiness/food industry management, general management, accounting, general marketing, and law.

Although the differences are not particularly large, this subset of agribusiness programs has higher average SCH requirements for the math/statistics/computer; economics; agricultural economics; agribusiness; and business course categories than does the entire set of agribusiness programs. However, the mean technical agriculture requirement for the subset is 4.23 SCH lower than the mean for all agribusiness programs; and the range in technical agricultural requirements for the subset is from 0 to 28 SCHs. Virtually all of the subset of agribusiness programs are offered by a Department of Agricultural Economics (or similar), while many from the entire set of agribusiness programs are offered by a Department of Agriculture (or similar).

To get a better sense of the main differences between agribusiness and agricultural economics programs, Table 3 groups Table 2 results into agricultural economics (AE)-intensive course areas and agribusiness (AB)-intensive course areas. The AE-intensive areas include Math/Statistics/Computer, Economics, and Agricultural Economics; and the AB-intensive areas include Agribusiness, Business, and Other.[7] On average, agribusiness programs include 4.5 fewer SCHs from the AE-intensive course areas than agricultural economics programs and 11.09 more SCHs from AB-intensive course areas. On net, agribusiness programs require 6.59 more

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[7] "Other" was grouped in the AB-intensive course areas because Law, the dominant member of this group, is more often associated with agribusiness programs. The Agriculture course area from Table 2 is not included in Table 3. It is not intuitively clear if this course area should be considered AE- or AB-intensive.

SCHs in these two areas than agricultural economics programs. Because the overall size of the two programs are within .07 SCHs of each other (125.28 SCHs for AB programs versus 125.21 SCHs for AE programs), the bulk of this 6.59 SCH difference has come from course areas such as English, humanities, social science, science, and electives. One way to interpret these results is to conclude that agribusiness programs are typically more focused on courses closely aligned with the thrust of the programs than are agricultural economics programs.

Summary and Concluding Thoughts

The bottom line is that across the spectrum of courses required by the various programs, agribusiness majors take one less 3.0 SCH math course than agricultural economics majors; one less economics course; and one less general agricultural economics course. As a tradeoff, agribusiness majors take an average one more agribusiness course, two additional general business courses, one more general agricultural course, and one additional "other" course. The difference of one 3.0 SCH course comes at the expense of a general education/free elective course. As stated earlier, differences in requirements at departments offering both curricula are slightly less.

At the Lifetime Achievement Award Symposium last year, there was a spirited discussion of whether the trend toward agribusiness programs was cosmetic, primarily a marketing tool, or whether it has involved a major change in emphasis. We leave it to the reader as to whether the average difference of seven courses out of the approximately 42 required for graduation is significant. However, because these differences in curricula are based on averages, it appears obvious that some departments have made few if any changes in course requirements, whereas others have truly created a distinctive agribusiness degree.

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Table 1. Summary of Selected Course Requirements for Agribusiness (AB), Agricultural Economics (AE), and Agribusiness/Agricultural Economics (ABAE) Baccalaureate Programs.[a]

Course/Course Area	AB		AE		ABAE	
	mean	SE[b]	mean	SE	mean	SE
	--------semester credit hours---------					
Math/Statistics/Computer	12.36	0.40	14.95	0.84	12.20	0.95
Calculus {M}	2.10	0.17	3.29	0.25	2.22	0.65
Other math (e.g., algebra) {M}	2.72	0.19	3.01	0.47	2.47	0.50
Statistics/probability/econometrics {A, AE, B, E, M}	3.43	0.19	4.58	0.31	4.13	0.41
Computer science/applications {A, AE, B, CS}	2.90	0.19	2.65	0.26	2.75	0.41
Management science, operations management {AE, B}	0.65	0.11	0.30	0.13	0.25	0.25
Quantitative applications (e.g., math. econ.) {AE, B, E}	0.56	0.11	1.12	0.24	0.38	0.27
Economics	10.14	0.40	13.98	0.62	11.89	1.20
Microeconomic principles {AE, E}	3.76	0.14	3.46	0.21	3.44	0.36
Macroeconomic principles {AE, E}	2.55	0.10	2.54	0.18	2.94	0.09
Intermediate microeconomics {AE, E}	1.32	0.15	2.46	0.27	1.25	0.45
Intermediate macroeconomics {AE, E}	0.76	0.12	2.37	0.22	1.00	0.43
Money & banking/financial markets {B, E}	0.41	0.09	0.73	0.21	0.56	0.33
Managerial economics {AE, E}	0.22	0.07	0.38	0.17	0.28	0.22
International trade/economics {AE, E}	0.58	0.09	0.84	0.21	0.93	0.38
International economic development {AE, E}	0.09	0.04	0.12	0.09	0.00	0.00
Industrial organization {AE, E}	0.10	0.05	0.00	0.00	0.00	0.00
Miscellaneous economics {E}	0.04	0.02	0.15	0.08	0.11	0.11
Economics electives {E}	0.33	0.12	0.92	0.31	1.38	0.55
Agricultural Economics	13.70	0.56	16.83	1.07	16.36	1.19
Farm/ranch management {AE}	1.62	0.16	1.92	0.25	2.06	0.56
Farm business analysis/records/accounting {AE}	0.58	0.13	0.26	0.13	0.39	0.27
Production economics {AE}	0.36	0.09	0.81	0.22	0.75	0.39
Agricultural/food policy {AE}	1.54	0.13	1.73	0.23	1.22	0.37
Other public policy {AE, E}	0.08	0.04	0.22	0.13	0.21	0.21
Prices/price analysis {AE}	0.96	0.13	1.78	0.26	1.29	0.41
Agricultural marketing {AE}	2.05	0.13	1.97	0.24	1.94	0.53
Futures {AE}	0.51	0.10	0.45	0.15	0.69	0.34
Cooperatives {AE}	0.25	0.07	0.15	0.10	0.00	0.00
Finance {AE, B, E}	3.24	0.19	1.99	0.36	3.59	0.38
Appraisal, real estate {AE, B}	0.15	0.05	0.08	0.06	0.13	0.13
Natural resource/environmental/land economics {AE}	0.67	0.12	1.84	0.41	0.53	0.31
Rural/economic development {AE, E}	0.07	0.03	0.12	0.09	0.42	0.29
Decision analysis {AE, B}	0.05	0.03	0.10	0.09	0.17	0.17
Consumer economics/personal finance {AE, B, E}	0.02	0.01	0.03	0.03	0.00	0.00
Miscellaneous agricultural economics {AE}	0.12	0.05	0.12	0.09	0.25	0.25
Agricultural economics electives	1.42	0.29	3.27	0.91	2.72	0.87

Table 1. (continued)

Course/Course Area	AB		AE		ABAE	
	mean	SE	mean	SE	mean	SE
	-------semester credit hours---------					
Agribusiness	4.76	0.41	2.04	0.43	4.92	1.21
Introduction to agribusiness {AE}	0.55	0.12	0.26	0.15	0.00	0.00
Agribusiness/food industry management {AE}	2.21	0.18	0.95	0.21	1.97	0.42
Agribusiness/food product marketing {AE}	0.76	0.13	0.18	0.11	1.28	0.59
Other marketing (e.g., sales) {AE}	0.62	0.11	0.37	0.20	0.70	0.34
Human resources/organizational behavior {AE}	0.10	0.04	0.04	0.04	0.50	0.34
International business {AE}	0.20	0.06	0.14	0.09	0.19	0.19
Risk management/insurance {AE, B}	0.03	0.02	0.05	0.03	0.00	0.00
Business policy/strategy/planning {AE,B}	0.29	0.08	0.05	0.03	0.28	0.28
General Business	11.68	0.64	5.62	0.59	8.85	2.48
Management {B}	1.47	0.17	0.01	0.01	0.75	0.54
Human resources/organizational behavior {B}	0.81	0.14	0.17	0.10	0.00	0.00
Accounting {B}	5.11	0.22	3.79	0.41	4.72	0.56
Marketing {B}	1.63	0.19	0.29	0.15	0.50	0.34
International business {B}	0.25	0.10	0.00	0.00	0.75	0.75
Business policy/strategy/planning {B}	0.35	0.09	0.00	0.00	0.50	0.34
Management information systems {AE, B}	0.26	0.07	0.12	0.09	0.25	0.25
Small business management/entrepreneurship {AE, B}	0.22	0.08	0.09	0.09	0.00	0.00
Business electives {B}	1.58	0.31	1.15	0.51	1.38	0.55
Agriculture	12.17	0.98	9.12	1.30	6.94	2.04
Technical agriculture (e.g., animal science) {A}	11.75	0.95	8.65	1.24	6.94	2.04
World food/international agriculture {A, AE}	0.41	0.10	0.47	0.22	0.00	0.00
Other	5.15	0.79	2.83	0.50	5.58	1.14
Leadership {A, AE, B}	0.31	0.08	0.18	0.12	0.25	0.25
Law {AE, B}	2.09	0.16	0.90	0.23	1.63	0.50
Ethics {A, AE, B}	0.17	0.06	0.09	0.09	0.78	0.41
Communications {A, AE, B}	0.53	0.11	0.31	0.17	0.50	0.34
Internship/cooperative study/practicum {A, AE, B}	0.85	0.23	0.04	0.03	0.71	0.23
Seminar/senior project/current topics/etc. {A, AE, B, E}	1.21	0.16	1.32	0.26	1.71	0.53
Program Total	125.62	0.49	125.44	0.75	127.89	2.46

a. Letters in braces {} denote the department(s) typically offering the course(s): A = agricultural departments (e.g., animal science, agronomy, general agriculture), AE = agricultural economics/agribusiness (or similar), B = business school departments (e.g., accounting, finance, management, marketing), CS = computer science (or similar), E = economics, and M = mathematics. At some institutions, agricultural economics/agribusiness courses are taught within an Agricultural Department or School. Nonetheless, we treated these courses as if they were taught in an agricultural economics department.

b. Standard error of the mean.

Table 2. Summary of Selected Course Requirements for Agribusiness (AB) and Agricultural Economics (AE) Baccalaureate Programs at Institutions Offering Both Programs.[a]

Course/Course Area	AB		AE		AB-AE	
	mean	SE[b]	mean	SE	mean	SE
	--------semester credit hours---------					
Math/Statistics/Computer	13.93	0.78	15.41	0.90	-1.49	0.64
Calculus {M}	3.13	0.32	3.50	0.23	-0.37	0.24
Other math (e.g., algebra) {M}	2.57	0.42	2.98	0.54	-0.40	0.26
Statistics/probability/econometrics {A, AE, B, E, M}	3.98	0.33	4.72	0.34	-0.74	0.28
Computer science/applications {A, AE, B, CS}	2.46	0.24	2.70	0.24	-0.24	0.15
Management science, operations management {AE, B}	0.84	0.25	0.31	0.15	0.52	0.22
Quantitative applications (e.g., math. econ.) {AE, B, E}	0.95	0.25	1.21	0.26	-0.26	0.26
Economics	12.10	0.73	14.33	0.68	-2.23	0.81
Microeconomic principles {AE, E}	3.44	0.18	3.44	0.18	0.00	0.00
Macroeconomic principles {AE, E}	2.80	0.14	2.67	0.16	0.13	0.11
Intermediate microeconomics {AE, E}	1.70	0.31	2.47	0.30	-0.77	0.29
Intermediate macroeconomics {AE, E}	1.59	0.28	2.47	0.23	-0.89	0.26
Money & banking/financial markets {B, E}	0.53	0.20	0.69	0.23	-0.16	0.21
Managerial economics {AE, E}	0.56	0.21	0.34	0.18	0.22	0.18
International trade/economics {AE, E}	0.76	0.20	0.92	0.24	-0.15	0.17
International economic development {AE, E}	0.14	0.10	0.14	0.10	0.00	0.02
Industrial organization {AE, E}	0.14	0.11	0.00	0.00	0.14	0.11
Miscellaneous economics {E}	0.07	0.05	0.11	0.08	-0.04	0.08
Economics electives {E}	0.37	0.23	1.08	0.36	-0.71	0.29
Agricultural Economics	16.17	0.92	16.94	1.24	-0.78	1.04
Farm/ranch management {AE}	1.57	0.30	1.82	0.29	-0.26	0.30
Farm business analysis/records/accounting {AE}	0.52	0.25	0.31	0.16	0.21	0.22
Production economics {AE}	0.45	0.18	0.74	0.23	-0.29	0.17
Agricultural/food policy {AE}	1.64	0.25	1.68	0.26	-0.05	0.22
Other public policy {AE, E}	0.22	0.14	0.26	0.15	-0.04	0.15
Prices/price analysis {AE}	1.47	0.28	1.91	0.29	-0.44	0.18
Agricultural marketing {AE}	1.93	0.26	2.04	0.26	-0.11	0.24
Futures {AE}	0.63	0.21	0.47	0.17	0.15	0.12
Cooperatives {AE}	0.46	0.18	0.17	0.11	0.29	0.15
Finance {AE, B, E}	3.81	0.39	1.84	0.41	1.97	0.41
Appraisal, real estate {AE, B}	0.19	0.11	0.10	0.07	0.09	0.13
Natural resource/environmental/land economics {AE}	0.55	0.17	1.54	0.30	-0.99	0.28
Rural/economic development {AE, E}	0.09	0.06	0.03	0.02	0.06	0.06
Decision analysis {AE, B}	0.16	0.11	0.12	0.10	0.04	0.05
Consumer economics/personal finance {AE, B, E}	0.03	0.03	0.03	0.03	0.00	0.00
Miscellaneous agricultural economics {AE}	0.12	0.10	0.14	0.11	-0.02	0.02
Agricultural economics electives	2.33	0.74	3.73	1.04	-1.40	1.14

Table 2. (continued)

Course/Course Area	AB		AE		AB-AE	
	mean	SE	mean	SE	mean	SE
	--------semester credit hours--------					
Agribusiness	5.08	0.69	2.33	0.48	2.74	0.57
Introduction to agribusiness {AE}	0.31	0.17	0.31	0.17	0.00	0.00
Agribusiness/food industry management {AE}	2.57	0.33	1.07	0.24	1.50	0.31
Agribusiness/food product marketing {AE}	0.72	0.24	0.21	0.12	0.51	0.25
Other marketing (e.g., sales) {AE}	0.65	0.20	0.43	0.23	0.22	0.13
Human resources/organizational behavior{AE}	0.17	0.10	0.05	0.05	0.13	0.08
International business {AE}	0.19	0.12	0.17	0.11	0.03	0.06
Risk management/insurance {AE, B}	0.03	0.03	0.05	0.04	-0.02	0.02
Business policy/strategy/planning {AE}	0.42	0.20	0.05	0.04	0.37	0.18
Business	12.33	1.05	5.76	0.63	6.58	0.91
General management {B}	1.68	0.29	0.01	0.01	1.66	0.28
Human resources/organizational behavior{B}	0.84	0.28	0.10	0.06	0.74	0.26
Accounting {B}	5.57	0.48	3.82	0.45	1.76	0.51
General marketing {B}	1.41	0.32	0.24	0.15	1.18	0.32
International business {B}	0.41	0.32	0.00	0.00	0.41	0.32
Business policy/strategy/planning {B}	0.10	0.10	0.00	0.00	0.10	0.10
Management information systems {AE, B}	0.18	0.11	0.14	0.11	0.05	0.03
Small business management/entrepreneurship {AE, B}	0.18	0.11	0.10	0.10	0.08	0.16
Business electives {B}	1.94	0.65	1.34	0.59	0.59	0.53
Agriculture	7.84	1.46	8.22	1.30	-0.38	0.94
Technical agriculture (e.g., animal science) {A}	7.52	1.34	7.76	1.24	-0.25	0.92
World food/international agriculture {A, AE}	0.32	0.21	0.45	0.25	-0.13	0.09
Other	4.77	0.57	2.70	0.57	1.77	0.51
Leadership {A, AE, B}	0.23	0.14	0.21	0.14	0.02	0.15
Law {AE, B}	2.29	0.30	0.84	0.24	1.45	0.41
Ethics {A, AE, B}	0.00	0.00	0.00	0.00	0.00	0.00
Communications {A, AE, B}	0.55	0.23	0.36	0.19	0.19	0.15
Internship/cooperative study/practicum {A, AE, B}	0.36	0.15	0.05	0.04	0.31	0.14
Seminar/senior project/current topics/etc. {A, AE, B, E}	1.04	0.25	1.24	0.28	-0.20	0.20
Program Total	125.28	0.92	125.21	0.85	0.07	0.29

a. Letters in braces {} denote the department(s) typically offering the course(s): A = agricultural depart-ments (e.g., animal science, agronomy, general agriculture), AE = agricultural economics/agribusiness (or similar), B = business school departments (e.g., accounting, finance, management, marketing), CS = computer science (or similar), E = economics, and M = mathematics. At some institutions, agricultural economics/agribusiness courses are taught within an Agricultural Department or School. Nonetheless, we treated these courses as if they were taught in an agricultural economics department.

b. Standard error of the mean.

Table 3. Net Semester Credit Hour Differences in AE- Versus AB-Intensive Course Areas for Agribusiness (AB) and Agricultural Economics (AE) Baccalaureate Programs at Institutions Offering Both Programs.

Course Areas[a]	AB-AE
	--semester credit hours--
AE-intensive course areas	-4.50
AB-intensive course areas	11.09
AB-AE	6.59

a   AE-intensive course areas include Math/Statistics/Computer, Economics, and Agricultural Economics. AB-intensive course areas include Agribusiness, Business, and Other.