A Comparison of State and USDA Cost and Return Estimates

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Concern has been voiced that U.S. Department of Agriculture (USDA) Farm Costs and Returns Surveys are used for a wide variety of policy analyses but produce questionable estimates. USDA-developed crop and livestock cost and return estimates for New Mexico and other selected states are compared to estimates developed by state universities. Major differences exist, most important of which relate to the ability of the survey respondent to answer the questions posed. Regardless of the cause of the differences, closer cooperation between the USDA and state universities clearly is needed to develop consistent estimates.

Key words: cost and return estimates, USDA Farm Costs and Returns Surveys.

The U.S. Department of Agriculture (USDA) was mandated by the Agriculture and Consumer Protection Act of 1973 to conduct a nationwide cost of production (COP) study for major program crops (cotton, wheat, and feed grains) plus dairy commodities (McElroy). The responsibility to conduct cost of production studies, to analyze results, and to establish current national weighted average costs of production for the specified commodities fell upon USDA's Economic Research Service (ERS), a responsibility that complemented ongoing, long-established ERS research efforts in estimating crop and livestock costs and returns (e.g., VanArsdall and Skold). The Food and Agriculture Act of 1977 extended the mandate to include rice but, perhaps more importantly, required that national weighted average costs of production be used to adjust target prices for corn, wheat, cotton, and rice (McElroy).[1]

Currently, ERS conducts USDA-COP studies, now called the Farm Costs and Returns Survey (FCRS), for cotton, wheat, grain sorghum, corn, soybeans, peanuts, flax, sunflowers, sugar, tobacco, rice, cattle, hogs, sheep, and dairy. Producers of each commodity are surveyed on a three- to five-year rotational cycle using an enumerative survey developed by ERS and USDA's National Agricultural Statistics Service (NASS) (McElroy). Surveys are conducted by NASS, and composite survey results are analyzed by ERS. The results of FCRS studies, and interpolations for crops not surveyed that year, are published annually in several forms. The most detailed livestock cost and return estimates[2] are released in limited quantities in loose-leaf form (e.g., USDA-ERS 1986b). State-level crop cost and return estimate summaries are published by ERS, as are regional weighted averages for all commodities (e.g., Davenport). The regional report, *Economic Indicators of the Farm Sector: Costs of Production,* is the major vehicle for publication of USDA-COP results (e.g., USDA-ERS 1986a).

In addition to providing the background for setting target prices and commodity program parameters, USDA crop budgets have been widely used in commodity program analyses (Congressional Budget Office; U.S. General Accounting Office), and livestock budgets have been widely used in assessing the impact of

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[1] The Farm Bill of 1981 removed the requirement to use cost of production estimates in adjusting farm program parameters, except for peanuts. The 1981 legislation also revised the methods by which certain costs, especially opportunity costs on owned resources, were calculated (McElroy).

[2] The word budget commonly is used to mean a cost and return estimate. This interchangeable phraseology, although common, is sloppy. In the agricultural economics discipline, a budget is a forecast or a forward plan. In this article, the phrase "cost and return estimate" is defined as an historical estimate.

changing public land policies in the west (Gee et al. 1986a, b). Further, both crop and livestock budgets and other data collected through FCRS have been used to assess the financial situation in agriculture (e.g., Bertelsen; Nielsen and Morehart; and Morehart, Nielsen, and Johnson).

Although the motivation for state university researchers and extension specialists to estimate costs and returns of crop and livestock production has, at times, been different than the motivation for ERS researchers, results nevertheless should be comparable. Concern has been voiced by several cost-of-production researchers that USDA estimates are not similar to estimates produced by land grant universities (Helmers), that severe sampling errors make FCRS data statistically unreliable leading to erroneous policy conclusions (Simunek), and that inaccurate farm-level records greatly influence questionnaire responses and thus distort economic interpretation (Evans).

Significantly different data collection methods can lead to significantly different results. USDA uses a formal survey questionnaire (for example, the 1989 wheat FCRS survey form was approximately 30 pages long). Universities typically use county-level or area-level producer panels (Libbin; Myer and Hackett; Myer and Torell; Torell, Williams, and Brockman), individual interviews (Gray, Jones, and Fowler; Mitchell and Garrett) or farm records data (Schurle; Workman; Lattz; Nott et al.) to estimate average costs and returns. All three forms of data collection, and different methods of data analysis, have shortcomings. But each method should yield substantially the same results, if results are to be believable and useful.

The hypothesis of this study is that FCRS results differ substantially from state-level budgets. Because neither data set can be proved to be more accurate, the hypothesis of this report (if correct) would suggest that more coordination between USDA and land-grant universities is needed. The impetus for this conclusion comes from the continued use of FCRS analyses for policy and farm program studies and for other agricultural economics research versus the local knowledge and reliability of university studies. Use of erroneous data can lead to improper conclusions about the financial well-being of agricultural producers, resulting in inappropriate agricultural policy

prescriptions, and can lead to improper results and conclusions in research based on cost-of-production estimates.

The primary objective of this report is to compare USDA budgets, which use FCRS data defined to describe New Mexico farm and ranch production situations, with budgets developed by New Mexico State University (NMSU) researchers. Subobjectives include analyses of the differences and their possible causes.

Because New Mexico is a relatively minor agricultural producing state, USDA-COP survey results could differ greatly from the actual cost of production and still not affect the national average in any major way. To verify New Mexico comparisons, crop budgets from Illinois, Kentucky, and Missouri and livestock budgets from Colorado and Washington are compared to USDA-COP budgets. However, this comparison falls prey to the same argument advanced with respect to USDA-COP budgets, i.e., the lack of local knowledge. Consequently, these comparisons must be viewed with caution.

Cost and Return Calculation Methods

NMSU crop and livestock cost and return estimates for 1986[3] were modified and recalculated using the USDA-COP format. Many assumptions about opportunity costs for nonpurchased factors of production (such as farmer-owned capital reserves and family labor), as specified by ERS (Davenport), were substituted into the NMSU estimates. Because ERS publishes, at most, one budget for each commodity for each state while NMSU publishes budgets developed for local production areas, NMSU budgets were weighted and rewritten to conform to the USDA budget format. Further, NASS-New Mexico Department of Agriculture (NMDA) yields and prices were used in the adjusted NMSU budgets (USDA-NASS-NMDA). Other estimates, such as amount of inputs and prices of inputs and outputs, were not modified to conform to ERS assumptions. ERS prices and yields do not conform to USDA-NASS published data for

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[3] The 1986 production year was selected because at the time this research was initiated, it was the most current year for which USDA-COP budgets were available at the state level (Davenport).

Table 1.   1986 Yields and Prices NMSU, NASS-NMDA, ERS-FCRS

	Yield			Price		
	NMSU	NASS-NMDA	ERS-FCRS	NMSU	NASS-NMDA	ERS-FCRS
Crop Budgets						
Irrigated Wheat (bu.)	52.0	44.0	20.8	2.25	2.25	2.25
Dryland Wheat (bu.)	14.0	13.5	11.1	2.25	2.25	2.25
Irrigated Cotton (lb.)	702.4	595.0	596.4	0.68	0.56	0.48
Dryland Cotton (lb.)	200.0	595.0	70.7	0.51	0.56	0.48
Irrigated Grain Sorghum (bu.)	83.8	79.6	70.5	1.70	1.70	1.81
Dryland Grain Sorghum (bu.)	32.8	32.5	30.6	1.70	1.70	1.81
Livestock Budgets						
Steer Calves ($/cwt.)				71.00	65.40	68.00
Heifer Calves ($/cwt.)				59.50	65.40	61.00
Feeder Steers ($/cwt.)				63.00	55.70	60.88
Cull Cows ($/cwt.)				35.00		35.85

Note: NMSU = New Mexico State University; NASS-NMDA = National Agricultural Statistics Service–New Mexico Department of Agriculture; ERS-FCRS = Economic Research Service–Farm Costs and Returns Survey.

New Mexico as shown in table 1 (USDA-NASS-NMDA).[4]

The New Mexico budget comparison includes the primary field crops grown in New Mexico for which USDA had prepared budgets and for feeder cattle. USDA methods of calculating returns, operating costs, and opportunity costs (called economic costs by ERS) were used whenever possible.[5] The concepts of key interest include calculation of returns, land costs, interest costs, and capital costs.

Concerning returns, USDA-COP assumes cash receipts includes all sales of primary commodities (such as corn or wheat for grain or cotton lint) and all sales of secondary commodities (such as cottonseed, wheat straw, and crop residue grazing) but specifically excludes government program payments. NMSU budgets include all crop sales, as well as government program payments. Government program payments were excluded from the budget comparison, however.

Crop Budgets

NMSU crop cost and return estimates were weighted by the share of total production rep-resented by each budget to compile weighted averages for each commodity budgeted by ERS. Each NMSU crop budget was weighted by the number of acres produced under flood and sprinkler irrigation in each county, as reported by Lansford et al., and by per-acre yields as reported by USDA-NASS-NMDA. Differences for each cost and return category between NMSU and USDA budgets were calculated and reasons for differences were suggested. Finally, similar calculations were performed for Illinois, Kentucky, and Missouri, but no reasons for differences are suggested.

Livestock Budgets

USDA livestock budgets are prepared for various regions of the United States. For feeder cattle, two defined regions include areas in New Mexico; the Great Plains (GP4) region includes the northeast corner of the state, and the Western (W7) region includes all other New Mexico ranching areas (USDA-ERS 1986b). The USDA GP4 region is directly comparable to two sizes of feeder cattle budgets prepared by NMSU for the northeast corner of New Mexico. The W7 region includes the four other NMSU budget regions. A composite NMSU livestock budget was prepared by weighting the four regional budgets by the number of livestock operators of various size classes in each ranching area, as reported by the 1982 Census (U.S. Department of Commerce). Three sizes of composite W7 budgets (small, medium, and large) were compared to those defined by USDA.

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[4] The New Mexico Agricultural Statistics annual report lists yield and acreage data for all agricultural producing counties in New Mexico (USDA-NASS-NMDA). NMSU does not prepare budgets for all counties, thus a slight difference between NMSU and NASS-NMDA yields exists in table 1.

[5] More detailed descriptions of ERS methods can be found in Davenport; McElroy; or Hoffman and Gustafson, and more detailed descriptions of NMSU methods can be found in Sullivan et al.; Sullivan and Libbin; Libbin; and Torell.

Table 2. Weighted Per-Acre NMSU vs. USDA Crop Costs and Returns Estimates, 1986

	Irrigated Wheat				Dryland Wheat			
	NMSU	USDA	Differ-ence	USDA % of NMSU	NMSU	USDA	Differ-ence	USDA % of NMSU
Yield (bu./acre)	44.74	20.77	23.97	46.4	13.95	11.05	2.90	79.2
Price ($/bu.)	2.25	2.25	0.00	100.0	2.24	2.25	(0.01)	100.4
Cash Receipts ($)	159.32	59.89	99.43	37.6	51.41	29.90	21.51	58.2
Economic (full ownership) Costs ($):								
Variable cash expenses	148.15	100.84	47.31	68.1	20.48	17.16	3.32	83.8
General farm overhead	36.41	8.49	27.92	23.3	15.09	2.52	12.57	16.7
Taxes and insurance	0.82	5.88	(5.06)	717.1	0.24	2.61	(2.37)	1,087.5
Capital replacement	44.30	41.68	2.62	94.1	15.89	14.72	1.17	92.6
Allocated returns to owned inputs	87.94	30.94	57.00	35.2	32.11	19.39	12.72	60.4
Total Economic Costs	317.62	187.83	129.79	59.1	83.81	56.40	27.40	67.3
Residual returns to management and risk ($)	(158.30)	(127.94)	(30.36)	80.8	(32.39)	(26.50)	(5.89)	81.8

	Irrigated Cotton				Dryland Cotton			
	NMSU	USDA	Differ-rence	USDA % of NMSU	NMSU	USDA	Differ-ence	USDA % of NMSU
Yield (lb./acre)	702.35	596.42	105.93	84.9	200.00	70.74	129.26	35.4
Price ($/lb.)	0.65	0.48	0.17	73.8	0.51	0.48	0.03	94.1
Cash Receipts ($)	537.63	336.35	201.28	62.6	117.20	38.82	78.38	33.1
Economic (full ownership) Costs ($):								
Variable cash expenses	284.94	170.97	113.97	60.0	73.40	46.69	26.71	63.6
General farm overhead	39.83	25.16	14.67	63.2	15.04	2.60	12.44	17.3
Taxes and insurance	3.03	8.76	(5.73)	289.1	0.29	3.61	(3.32)	1,244.8
Capital replacement	100.60	44.42	56.18	44.2	26.67	20.40	6.27	76.5
Allocated returns to owned inputs	187.60	86.30	101.30	46.0	54.54	22.86	31.68	41.9
Total Economic Costs	616.00	335.61	280.39	54.5	169.94	96.16	73.78	56.6
Residual returns to management and risk ($)	(78.37)	0.74	(79.11)	(0.9)	(52.74)	(57.34)	4.60	108.7

	Irrigated Grain Sorghum				Dryland Grain Sorghum			
	NMSU	USDA	Differ-ence	USDA % of NMSU	NMSU	USDA	Differ-ence	USDA % of NMSU
Yield (bu./acre)	83.76	70.53	13.23	84.2	32.81	30.62	2.19	93.3
Price ($/bu.)	1.70	1.81	(0.11)	106.5	1.70	1.81	(0.11)	106.5
Cash Receipts ($)	181.45	127.66	53.79	70.4	55.31	55.42	(0.11)	100.2
Economic (full ownership) Costs ($):								
Variable cash expenses	181.63	122.70	58.93	67.6	26.81	28.71	(1.90)	107.1
General farm overhead	39.00	12.77	26.23	32.7	16.26	4.13	12.13	25.4
Taxes and insurance	1.02	8.26	(7.24)	809.8	0.24	3.47	(3.23)	1,445.8
Capital replacement	63.11	47.84	15.27	75.8	29.08	19.60	9.48	67.4
Allocated returns to owned inputs	110.36	64.62	45.74	58.6	47.17	30.35	16.82	64.3
Total Economic Costs	395.12	256.19	138.92	64.8	119.56	86.26	33.30	72.1
Residual returns to management and risk ($)	(213.66)	(128.53)	(85.13)	60.2	(64.25)	(30.84)	(33.41)	48.0

Table 3. Weighted Per-Cow NMSU vs. USDA Cow-Calf Costs and Returns Estimates, 1986

	Large W-7 Ranch				Small W-7 Ranch			
	NMSU	USDA	Difference	USDA % of NMSU	NMSU	USDA	Difference	USDA % of NMSU
Herd Size (no. cows)	536	1,068	(532)	199.3	92	50	42	54.3
Calf Crop (%)	79.0	78.0	1.0	98.7	77.0	87.0	(10.0)	113.0
Sale Weight (steers) (lbs.)	478	420	58	87.9	447	420	27	94.0
Sale Weight (heifers) (lbs.)	435	398	37	91.5	416	398	18	95.7
Replacement Rate (%)	15.0	10.0	5.0	66.7	12.0	16.0	(4.0)	133.3
Calf Loss (birth to weaning) (%)	3.0	3.4	(0.4)	113.3	4.0	6.7	(2.7)	167.5
Cow Loss (%)	1.0	2.1	(1.1)	210.0	2.0	3.1	(1.1)	155.0
Cash Receipts ($)	287.39	225.77	61.62	78.6	234.48	220.22	14.26	93.9
Variable Costs ($)	133.09	143.03	(9.94)	107.5	181.79	172.47	9.32	94.9
Ownership Costs ($)	67.41	66.89	0.52	99.2	116.97	98.05	18.92	83.8
Other Costs ($)	81.69	38.24	43.45	46.8	186.81	221.64	(34.83)	118.6
Total Costs	282.19	248.16	34.03	87.9	485.58	492.16	(6.58)	101.4
Residual Returns to Management and Risk ($)	5.20	(22.39)	27.60	(430.4)	(251.10)	(271.94)	20.84	108.3

	Large GP-4 Ranch				Small GP-4 Ranch			
	NMSU	USDA	Difference	USDA % of NMSU	NMSU	USDA	Difference	USDA % of NMSU
Herd Size (no. cows)	550	1,178	(628)	214.2	190	180	10	94.7
Calf Crop (%)	87.0	85.0	2.0	97.7	87.0	89.0	(2.0)	102.3
Sale Weight (steers) (lbs.)	450	427	23	94.9	450	416	34	92.4
Sale Weight (heifers) (lbs.)	420	398	22	94.8	420	414	6	98.6
Replacement Rate (%)	15.0	15.4	(0.4)	102.7	15.0	15.6	(0.6)	104.0
Calf Loss (birth to weaning) (%)	3.0	2.4	0.6	81.0	3.5	3.2	0.3	91.4
Cow Loss (%)	1.0	1.9	(0.8)	185.0	1.0	3.0	(2.0)	300.0
Cash Receipts ($)	346.50	290.58	55.92	83.9	346.69	287.15	59.54	82.8
Variable Costs ($)	133.23	95.48	37.75	71.7	119.24	180.84	(61.60)	151.7
Ownership Costs ($)	73.63	68.58	5.05	93.1	80.04	81.44	(1.40)	101.7
Other Costs ($)	125.89	283.12	(157.23)	224.9	172.27	260.98	(88.71)	151.5
Total Costs	332.74	447.18	(114.44)	134.4	371.55	523.26	(151.71)	140.8
Residual Returns to Management and Risk ($)	13.75	(156.60)	170.36	(1,138.5)	(24.86)	(236.11)	211.25	949.7

Table 3. Continued

	Medium W-7 Ranch			
	NMSU	USDA	Difference	USDA % of NMSU
Herd Size (no. cows)	207	213	(6)	102.9
Calf Crop (%)	79.0	84.0	(5.0)	106.3
Sale Weight (steers) (lbs.)	463	420	43	90.7
Sale Weight (heifers) (lbs.)	427	398	29	93.2
Replacement Rate (%)	14.0	12.0	2.0	85.7
Calf Loss (birth to weaning) (%)	3.0	4.4	(1.4)	146.7
Cow Loss (%)	1.0	3.0	(2.0)	300.0
Cash Receipts ($)	278.99	231.43	47.56	83.0
Variable Costs ($)	137.04	190.20	(53.16)	138.8
Ownership Costs ($)	80.34	72.08	8.26	89.7
Other Costs ($)	113.96	160.06	(46.10)	140.4
Total Costs	331.35	422.34	(90.99)	127.5
Residual Returns to Management and Risk ($)	(52.36)	(190.91)	138.55	364.6

Similar to the crop budgets, differences for each livestock cost and return category were estimated and possible reasons for the differences discussed. In addition to NMSU budget comparisons, Colorado and Washington livestock budgets prepared for 1986 also were compared to USDA budgets.

New Mexico Results

Crop Estimates

A total of 20 NMSU irrigated wheat budgets (11 flood and nine sprinkler irrigated) representing 14 counties were weighted and averaged for comparison with the single USDA irrigated wheat budget for New Mexico (table 2). Substantially lower yields (44.74 NMSU and 20.77 USDA bushels per acre) and vastly different costs (especially those for the major cash expenses) led to a $30.36 per-acre difference in residual returns to management and risk. Virtually all primary inputs were estimated by USDA to be substantially different from NMSU estimates.

A yield difference of 2.9 bushels per acre and a $27.40 cost difference between NMSU and USDA contributed to a $5.89 per-acre difference in dryland wheat residual returns. A total of nine NMSU budgets for six counties were weighted for comparison with the USDA estimate.

NMSU estimates of cotton production costs and returns included budgets for flood and sprinkler irrigation systems (14 flood and one sprinkler), stripper and picker varieties (seven stripper and eight picker), and Upland and Pima cotton (14 Upland and one Pima) for a total of 15 budgets in 9 counties. Again, substantially different yields and costs contributed to a large difference of $79.11 per-acre residual returns, but these factors were compounded by a much different reported price ($.65 versus $.48 per pound). USDA's estimates must have ignored New Mexico's production of Acala (higher quality, thus higher priced) cotton.

USDA and NMSU (one budget in one county) estimates of dryland cotton costs and returns actually produced a similar residual return, but for greatly different reasons. A large difference in yields (200 pounds NMSU versus 70.74 pounds USDA) and substantially different input costs offset each other.

Grain sorghum budget comparisons provide similar differences in cost and return estimates.

Different yields, prices, and costs contributed to per-acre differences in residual returns of $85.13 for irrigated and $33.41 for dryland grain sorghum. A total of 13 irrigated NMSU budgets (eight flood and five sprinkler) representing eight counties were averaged, and six dryland NMSU budgets representing five counties were weighted for comparison with USDA estimates.

Livestock Estimates

Ranch budgets for five New Mexico ranching areas and two different size classes were compared to regional USDA budgets. Like the crop budget comparisons, substantial differences between USDA and NMSU cow/calf budgets were found (table 3). In general, lower reported gross returns and higher costs resulted in lower net returns for USDA budgets. Differences in the residual return to risk and management for NMSU versus USDA budgets ranged from nearly the same for the small W-7 budget to NMSU returns 11 times greater than USDA estimates for the large GP-4.

USDA estimates of lower livestock sales resulted for two main reasons. First, sale prices used by USDA were $2 to $3 lower per cwt. than NMSU estimates (table 1). Second, sale weights were about 20 pounds lighter. Other production rates (calf crop, death losses, replacement rates) were, in general, defined to be similar.

USDA ranch budgets reflect a ranch that depends heavily on leased private rangeland. Private leasing of forage is common in the northeast corner of New Mexico (the USDA GP-4 region) but not common in the rest of the state, at least not so common that one would define this to be a typical production practice. A higher dependence on private leased forage, versus public and state lands, was the main factor contributing to higher USDA cost estimates. Other extreme differences also are shown in the budget comparisons.

Other State Results

Crop Estimates

Three states other than New Mexico were selected to provide crop budget examples to determine whether the New Mexico results were aberrations or whether the problems were common between university and USDA budgets. Illinois, Kentucky, and Missouri were

chosen for comparison because all three are significantly larger producers of agricultural products than New Mexico, which should make each state a more likely candidate for survey under the FCRS system. Further, each of the three states annually publishes cost and return estimates, and each budget is partially based on actual farm records data (Data sources: Illinois, Lattz; Kentucky, Shurley and Trimble; Missouri, Workman). The selection of crops for comparison between state and USDA was based solely on which crops were common to both sources.

As can be seen in the budget comparisons in table 4, there is a great deal of difference between the two sets of cost and return estimates. No pattern seems to emerge as to which categories are consistently under- or overestimated.

Livestock Estimates

Based on availability of 1986 feeder cattle budgets, budgets prepared for small size ranches by Colorado State University (CSU) (Gutierrez et al.) for northeast and southwest Colorado ranching areas were compared to USDA budgets in the GP-3 and W-6 USDA regions (table 5). Livestock budgets also were prepared for Washington (Warnock and Carkner), and these budgets were compared to the USDA W-2 region in the Pacific Northwest. Because calculation procedures for overhead costs were not clearly defined in these state budgets and thus not easily converted to the USDA format, we were only able to calculate net returns over variable costs for budget comparison.

USDA budgets for these two states were much more closely defined to the state-level budgets prepared by the state university. Similar to the NMSU budget comparison, gross return estimates by USDA were about 10% to 15% less than university budgets. Variable costs were similarly defined between the two budget sources. Because of lower gross sales, USDA estimated net returns over variable costs to be lower. But, in general, state budgets for Colorado and Washington resulted in a much more acceptable comparison with USDA budgets than did the New Mexico budgets.

Causes of Disparities and Conclusions

The purpose of this article was not to criticize USDA's budget process but rather to compare

Table 4. Weighted Per-Acre University vs. USDA Costs and Returns Estimates, Selected States, 1986

	Illinois Corn				Illinois Soybeans			
	UI	USDA	Differ-ence	USDA % of UI	UI	USDA	Differ-ence	USDA % of UI
Yield (bu./acre)	148.18	134.48	13.70	90.8	45.10	39.78	5.32	88.2
Price ($/bu.)	2.00	1.39	0.61	69.5	5.09	4.64	0.45	91.2
Cash Receipts ($)	296.37	186.93	109.44	63.1	229.57	184.58	44.99	80.4
Economic (full ownership) Costs ($):								
Variable cash expenses	175.01	134.83	40.18	77.0	108.44	52.92	55.52	48.8
General farm overhead	11.03	12.60	(1.57)	114.2	10.91	11.54	(0.63)	105.8
Taxes and insurance	17.47	24.12	(6.65)	138.1	17.13	20.75	(3.62)	121.1
Capital replacement	28.39	35.07	(6.68)	123.5	22.93	25.70	(2.77)	112.1
Allocated returns to owned inputs	108.30	48.45	59.85	44.7	103.97	68.64	35.33	66.0
Total Economic Costs	340.19	255.07	85.12	75.0	263.38	179.55	83.83	68.2
Residual returns to management and risk ($)	(43.83)	(68.14)	24.31	155.5	(33.81)	5.03	(38.84)	(14.9)

	Kentucky Corn				Kentucky Soybeans			
	UK	USDA	Differ-ence	USDA % of UK	UK	USDA	Differ-ence	USDA % of UK
Yield (bu./acre)	100.00	90.81	9.19	90.8	36.00	31.20	4.80	86.7
Price ($/bu.)	1.95	1.93	0.02	99.0	5.10	4.89	0.21	95.9
Cash Receipts ($)	195.00	175.26	19.74	89.9	183.60	152.57	31.03	83.1
Economic (full ownership) Costs ($):								
Variable cash expenses	173.28	119.49	53.79	69.0	111.09	68.29	42.80	61.5
General farm overhead	0.00	9.26	(9.26)	*	0.00	7.20	(7.20)	*
Taxes and insurance	10.00	7.39	2.61	73.9	10.00	5.35	4.65	53.5
Capital replacement	32.00	26.43	5.57	82.6	29.00	22.96	6.04	79.2
Allocated returns to owned inputs	13.52	65.96	(52.44)	487.9	7.88	59.16	(51.28)	750.8
Total Economic Costs	228.80	228.53	0.27	99.9	157.97	162.96	(4.99)	103.2
Residual returns to management and risk ($)	(33.80)	(53.27)	19.47	157.6	25.63	(10.39)	36.02	(40.5)

	Missouri Corn				Missouri Soybeans			
	UM	USDA	Differ-ence	USDA % of UM	UM	USDA	Differ-ence	USDA % of UM
Yield (bu./acre)	121.10	113.65	7.45	93.8	35.50	32.28	3.22	90.9
Price ($/bu.)	1.48	1.29	0.19	87.2	4.53	4.46	0.07	98.5
Cash Receipts ($)	179.20	146.61	32.59	81.8	160.80	143.97	16.83	89.5
Economic (full ownership) Costs ($):								
Variable cash expenses	136.85	102.83	34.02	75.1	82.75	43.85	38.90	53.0
General farm overhead	10.85	8.37	2.48	77.1	6.95	7.44	(0.49)	107.1
Taxes and insurance	0.00	9.97	(9.97)	*	0.00	8.10	(8.10)	*
Capital replacement	26.95	33.46	(6.51)	124.2	21.75	25.01	(3.26)	115.0
Allocated returns to owned inputs	96.50	53.30	43.20	55.2	80.85	67.72	13.13	83.8
Total Economic Costs	271.15	207.93	63.22	76.7	192.30	152.12	40.18	79.1
Residual returns to management and risk ($)	(91.95)	(61.32)	(30.63)	66.7	(31.50)	(8.15)	(23.35)	25.9

Note: UI = University of Illinois (Lattz); UK = University of Kentucky (Shurley and Trimble); UM = University of Missouri (Workman).
* Percentage cannot be computed.

Table 5.   Per-Cow University vs. USDA Cow-Calf Costs and Returns Estimates, 1986

	Colorado Small GP-3				Colorado Small W-6			
	CSU	USDA	Difference	USDA % of CSU	CSU	USDA	Difference	USDA % of CSU
Herd Size (no. cows)	87	54	33	62.1	200	208	(8)	104.0
Calf Crop (%)	94.2	93.0	1.2	98.7	86.0	85.0	1.0	98.8
Sale Weight (steers) (lbs.)	511	456	55	89.2	450	445	5	98.9
Sale Weight (heifers) (lbs.)	486	410	76	84.4	430	412	18	95.8
Replacement Rate (%)	13.8	11.0	2.8	79.8	17.0	10.0	7.0	58.8
Calf Loss (birth to weaning) (%)	**	5.9			**	8.1		
Cow Loss (%)	1.2	2.1	(1.0)	185.2	2.0	2.4	(0.4)	120.0
Cash Receipts ($)	316.76	277.24	39.52	87.5	265.34	247.72	17.62	93.4
Variable Costs ($)	197.80	206.16	(8.36)	104.2	189.44	177.93	11.51	93.9
Income Above Variable Costs ($)	118.96	71.08	47.88	59.8	75.90	69.79	6.11	91.9

	Washington W-2			
	WSU	USDA	Difference	USDA % of WSU
Herd Size (no. cows)	150	197	(47)	131.3
Calf Crop (%)	92.0	90.0	2.0	97.8
Sale Weight (steers) (lbs.)	550	518	32	94.2
Sale Weight (heifers) (lbs.)	500	496	4	99.2
Replacement Rate (%)	20.0	11.0	9.0	55.0
Calf Loss (birth to weaning) (%)	**	6.5		
Cow Loss (%)	1.3	1.7	(0.4)	130.8
Cash Receipts ($)	300.99	278.07	22.92	92.4
Variable Costs ($)	219.03	208.31	10.72	95.1
Income Above Variable Costs ($)	81.96	69.76	12.20	85.1

Note: CSU = Colorado State University (Gutierrez et al.); WSU = Washington State University (Warnock and Carkner).
** Not reported.

USDA budget estimates for New Mexico and other selected states to the estimates published by state universities. The hypothesis tested was that USDA Farm Costs and Returns Survey results differ significantly from state-generated budgets. Based on our results, we accept this hypothesis. Major differences in both crop and livestock cost and return estimates were found for New Mexico. Crop budget comparisons for selected states other than New Mexico yielded similar disparities in budget results. Livestock budgets from the two budget sources were similar.

It is not necessary to assign fault with either USDA or state university cost and return estimates to conclude that major differences exist. Our approach was to compare USDA estimates to NMSU budgets using USDA assumptions concerning format and opportunity costs. We can only speculate as to the exact causes of the differences because there is no experimental control mechanism to determine differences in methods or results. Potential

causes of disparities might include the following:

(a) Local knowledge of a production area often helps to identify numerical errors and to analyze and judge whether a particular budget represents the area. Although USDA-FCRS employs local enumerators to collect farm-level data, analysis and interpretation of data and budget construction is coordinated in Washington. A specific example of the need for local knowledge is the 20.77 bushels-per-acre irrigated wheat yield included by ERS. This yield is a nonsensical number; it is too high for dryland production and too low for irrigated production. By comparison, USDA-NASS-NMDA reported 1986 irrigated yields to be 44 bushels per acre. (b) The USDA questionnaire is too long (30 pages for wheat, for example) to hold the attention of the respondent and calls for many estimates that the producer simply cannot answer with any degree of competence. Many opinions are asked without supporting accurate, complete, and verified

farm records. Without farm records, for example, answers given to questions concerning levels of liabilities (FCRS wheat questionnaire, Section X, USDA-NASS) cannot be considered valid. (*c*) Substantial differences exist between NASS-reported yields and prices and ERS-budgeted yields and prices, especially for years in which a crop-specific survey was not taken. USDA-ERS does not appear to use or conform to state-level data collected by USDA-NASS when formulating estimates of prices and yields. (*d*) Lack of crop-specific farm records leads to broad estimates by the respondent in answering the FCRS questionnaire. (*e*) Different samples for FCRS and university-developed estimates can certainly lead to differences. Sample differences would be especially evident for different types of crops (picker versus stripper cotton) and livestock production situations (public versus private range).

Various groups use USDA cost and return estimates to promote policies advantageous to their cause (*Farmline*). Our results call into question the validity of using USDA budgets, especially crop budgets, for research or for major policy decisions and evaluations. A much closer coordination between USDA and land grant universities in conducting cost and return studies is needed to improve USDA and university budget preparation processes.

If closer working relationships, possibly including joint state-level data collection, interpretation, and budget generation efforts between ERS, NASS, and state universities could be developed, more uniformity, accuracy, and efficiency could be obtained. Further, aggregate research costs might be reduced with more coordination and elimination of research duplication.

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