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Economic Impact Analysis of 4-H Youth Livestock Projects Using IMPLAN

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Abstract: 4-H, like all Extension programs, must answer the charge to demonstrate its long-term impact. This article introduces the idea of using IMPLAN, a software program that can be used to estimate economic impacts, to evaluate the impact of 4-H livestock projects. An example is provided based on data from a real county 4-H program. Using IMPLAN enables 4-H to describe the estimated economic impact from one of its largest project areas. Agents can and should use IMPLAN results to help communicate the value of 4-H to state legislators, county commissioners, and key stakeholders.

Introduction

In 2009, Lamm and Harder challenged Extension to "prove 4-H's worth by demonstrating clear return-on-investment to stakeholders" (4-H in Modern America, ¶ 2). 4-H faces a more difficult challenge in demonstrating return-on-investment, or economic impact, than most Extension program areas, because the impact of teaching life skills to youth is less readily quantifiable than are the impacts from programs designed to reduce pollution, poverty, or crop loss. However, there are components of 4-H that lend themselves to measuring economic impact. The 4-H livestock program is one of these components.

Background

The idea for measuring the economic impact from the 4-H livestock program is based on the work of Hanagriff, Murphy, Roberts, and Briers (2009). Hanagriff et al. studied the economic impact of FFA supervised agricultural experiences (SAE) and associated activities in Texas. SAEs require FFA members to complete an agriculturally related project, such as raising market animals or crops. As with 4-H projects, FFA members must invest varying amounts of money into their projects. Expenditures provide the basis for determining the economic impact of a project. Hanagriff et al. were able to use a method known as the "Impact Analysis for Planning" (IMPLAN) to determine that SAEs contribute \$189 million in total economic value to Texas annually.

IMPLAN

What Is IMPLAN?

The Impact Analysis for Planning (IMPLAN) software and associated databases support regional economic impact analysis of changes in industry activity, income, household spending, or employment for any area of the United States (MIG, Inc., 2009). IMPLAN estimates the economic multiplier or "spinoff" effects arising due to linkages in the supply chain (indirect effects) and employee household spending (induced effects), in addition to the direct changes in output, employment, or spending. Previous Extension research has used IMPLAN to calculate the impact of: forestry programming (Marcouiller, Ray, Schreiner, & Lewis, 1992), bio-fuel production (Fortenbery & Deller, 2008; Grebner, Perez-Verdin, Henderson, & Londo, 2009), taking farmland out of agricultural production (Nelson & Neufeld, 2003), and community economic development (Shields & Deller, 2003). However, little to no research has documented the use of IMPLAN for estimating the economic impact of 4-H livestock projects.

How Does IMPLAN Work?

An IMPLAN analysis starts with the measurement of direct spending. Direct spending for FFA or 4-H youth livestock projects typically includes expenditures such as purchase of animals, feed, housing, veterinary expenses, and equipment. This direct spending causes more money to be spent by vendors. For example, a shop owner who sells feed to an FFA or 4-H member can then use the profits from the sale to pay an electric bill or an employee or invest in additional inventory. These actions have a positive effect on the economy that is described as the total economic impact.

Information on the value of expenditures classified by type is needed to conduct an impact analysis. The IMPLAN analyst can then assign expenditure values to an appropriate industry sector in the IMPLAN model. For example, purchases of feed would be assigned to the Animal Food Manufacturing sector, while purchases of animals themselves would be assigned to the sector for Cattle Ranching and Farming, or Poultry and Egg Production, depending upon the type of animal.

It is also helpful to know the share of these expenditures that are made within the study region for an accurate analysis, because only these local expenditures have an impact in the region. If this is not known, however, the IMPLAN model has factors built-in to estimate this. 4-H members need to accurately report the geographic location (e.g., town or county) of all project purchases in order to use IMPLAN to calculate the total economic value of livestock projects. This is an important addition to the information currently asked for in many states' record books.

IMPLAN in Action

The authors tested the appropriateness of IMPLAN for calculating the economic value of 4-H livestock projects by collecting secondary data from intermediate and senior level livestock record books that had been submitted for fair judging in a Florida county in 2009. The authors found it is possible to use IMPLAN for 4-H, which is promising for agents interested in demonstrating the economic impact of 4-H. For example, there were nine beef projects conducted with total expenses reported of \$12,683 (Table 1). IMPLAN estimated the revenue generated from the members' purchases to be \$26,149. An estimated \$41,370 in output (revenue) was generated across the beef, dairy, swine, and poultry projects.

Table 1.

Economic Impacts of 4-H Livestock Projects Reported in a Florida County

	Beef	Dairy	Swine	Poultry	All Animals
Number of Projects	9	3	12	8	32
Total Expenses Reported	\$12,683	\$715	\$4,743	\$1,269	\$19,410
Total Statewide Impacts					
Output (Revenue)	\$26,419	\$1,473	\$11,081	\$2,666	\$41,370
Total Value Added	\$9,611	\$739	\$6,287	\$1,000	\$17,637
Labor Income	\$5,303	\$323	\$3,101	\$639	\$9,366
Other Property Income	\$3,345	\$367	\$2,731	\$293	\$6737
Indirect Business Tax	\$963	\$49	\$455	\$67	\$1534
Employment (full-time & part-time jobs)	.24	.01	.18	.02	.46
Average Impacts per Project					
Output (Revenue)	\$2,905	\$491	\$923	\$333	\$1,293
Total Value Added	\$1,068	\$246	\$524	\$125	\$551
Labor Income	\$589	\$108	\$258	\$80	\$293
Other Property Income	\$372	\$122	\$228	\$37	\$211
Indirect Business Tax	\$107	\$16	\$38	\$8	\$48
Employment (full-time & part-time jobs)	.03	<.01	.02	<.01	.01

Conclusions, Implications, & Recommendations

IMPLAN is a valuable tool for Extension agents looking to provide evidence of their 4-H program's economic impact. 4-H has the opportunity to use IMPLAN to make a strong statement about the impact that livestock projects have on the economy. Agents can use IMPLAN results to illustrate what their counties' 4-H livestock programs generate in value versus what the programs costs the counties to fund. Using IMPLAN results may help agents and educators in their efforts to justify continued public funding and donor support, both of which are essential to the continued success of the 4-H program.

In order to take advantage of IMPLAN as a tool, agents should do the following.

- Partner with a knowledgeable IMPLAN specialist; check with faculty in the economics department

within your college of agriculture.

- Check with your state's Institutional Review Board to determine if permission is needed to collect expenditure data from 4-H record books.
- Encourage 4-H members to be sure that *all* of their expenditures are documented as accurately as possible.
- Consider developing a Web form that members can use to enter their own expenses into a central database; going through the record books and recording data by hand is a time-consuming process.
- Revise record books and/or the Web form to include a space for members to report the geographic region where each item was purchased.
- Develop a plan for communicating the IMPLAN results to state legislators, county commissioners, and key stakeholders.

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