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Fall 2001

## *Economic Issues For Nebraskans*



Department of Agricultural Economics  
University of Nebraska-Lincoln

***In this issue:***

- ***Retailing trends***
- ***Food system evolution***
- ***Opportunities to enter agriculture***

UNIVERSITY OF  
**Nebraska**

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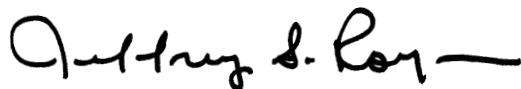
## Introducing Focus

On behalf of the Department of Agricultural Economics of the University of Nebraska–Lincoln, I am pleased to present to you the inaugural issue of *Focus: Economic Issues for Nebraskans*. In this and future issues of *Focus*, we will feature articles reporting research and analysis on issues of economic importance to Nebraska and Nebraskans. We also will highlight teaching and extension programs offered by our faculty. A section highlighting research will contain summaries of completed and ongoing projects. Another section will include news about faculty, staff, and others associated with the department.

We plan to publish *Focus* twice annually. To add your name to our mailing list, please see the form on the back cover. We also will be distributing *Focus* on the Internet. To view issues of the magazine online, visit our Web site at [agecon.unl.edu](http://agecon.unl.edu).

*Focus* is a work in progress. We welcome your suggestions regarding its content and format. Perhaps you have topics you would like to see covered in future issues. Please let us know. We also encourage you to contact our authors if you would like additional information or to offer comments on any of the research, teaching, or extension activities you see described.

We hope you benefit from reading this issue.



Jeffrey S. Royer  
Professor and Head



# F O C U S

## Economic Issues For Nebraska

Department of Agricultural Economics • University of Nebraska-Lincoln

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# Retailing trends and household buying patterns

by Bruce B. Johnson and John C. Allen

Few forces have changed the face of rural communities more than those associated with retailing activity. Empty buildings and old, fading signs remain a stark reminder of once-bustling retail commerce in an earlier era when virtually every town and village served as a retail trade center for the local population. Today, the smaller the community, the more difficult it is to maintain an appropriate degree of retail viability as consumer mobility increases while customer loyalty diminishes. Larger trade centers and “big-box” discount retailers compete aggressively for the consumer expenditure dollar, leaving “economic cannibalism” in their wake.

Yet regardless of community size, retailing activity, albeit in ever-changing form, still remains critical to overall economic viability. Moreover, access to a wide range of retail goods and services within a reasonable distance from home is considered by many to be an integral part of the quality of life we experience.

In this article, we first investigate retailing patterns across size classes of Nebraska counties and communities using taxable retail sales and retail pull factor measures. We then present a more detailed profile of current self-reported household retail buying patterns as provided by the recently completed 2000 Nebraska Rural Poll. From this we draw some implications for the future, with particular focus on economies in rural areas in the face of changing commerce.

## Geographic Trends and Patterns

While anecdotal evidence of retail shifts is obvious to any casual observer, a more definitive measure of retailing patterns is possible using the taxable retail sales series maintained by the Nebraska Department of Revenue and calculating a retail *pull factor*. The pull factor is the ratio of actual retail sales to potential retail sales. It is calculated by dividing the per capita retail sales for the local geographic unit by the state average per capita sales over the same period. The interpretation of the pull factor is straight-forward. If an area's pull factor is greater than 1.0, then the retail sales activity is exceeding its population in term of customer equivalents—i.e., there is trade capture. Conversely, a pull factor less than 1.0 means the area is losing potential retail activity to other places and is experiencing net trade leakage.

Using annual taxable retail sales, we have grouped the state's counties into four size classes and calculated retail pull factors. As seen in *Figure 1*, the state's 52 rural counties (those with no town of 2,500 or more population) had an average (mean) pull factor of .40 in 1999, implying a 60 percent trade leakage from those counties. In 1980, these same counties were capturing 70 percent of their retail potential and experiencing a leakage of only 30 percent. Over this period, even the small and large trade center counties experienced some deterioration of pull factor performance,

although the large trade center counties (those with a municipality of at least 7,500 population) continue to maintain some trade capture. The dramatic shift has been the trade capture expansion of the state's metro counties, which illustrates quite well the gravitation of more retailing activity towards the larger centers.

Using this same type of comparative analysis across Nebraska, town/city size classes reveal very similar shifts over time (*Figure 2*). The smaller the municipality, the more precipitous the decline of their retail pull factor, implying greater and greater trade leakage going to larger trade centers. And with that leakage has often gone a variety of activity deemed essential for sustainable economic activity.

Just what is behind these trends revealed by secondary data and aggregate analysis? What is happening at the household level in terms of retail buying patterns? Using the 2000 Nebraska Rural Poll, we are able to profile rural household retail patterns in some detail for the first time.

## Rural Household Retailing Patterns

Respondents to the 2000 Nebraska Rural Poll were asked to estimate the percentage of their household goods and services bought in their own community during the past year. As expected, the smaller their community, the smaller the proportion purchased there (*Figure 3*).

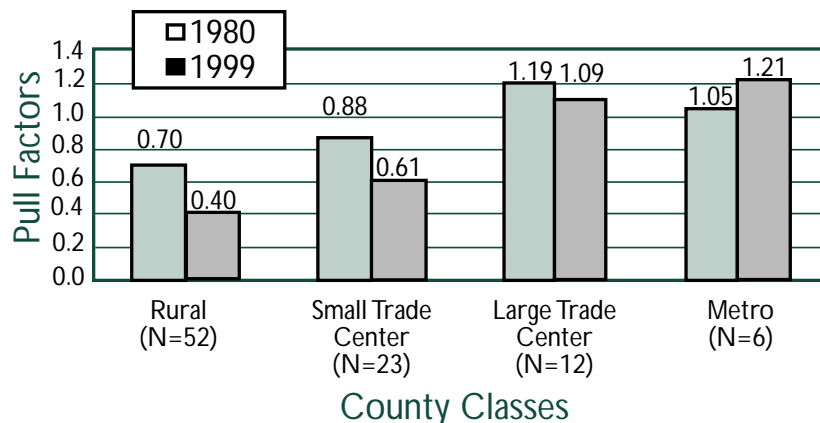
Those whose communities were less than 1,000 population reported acquiring less than half their goods and services there. Even those from communities of 1,000 to 4,999 acquired nearly half their household needs elsewhere. Only rural households whose home communities were larger than 10,000 population indicated high level of local purchases; but even here very few households indicated a total dependence on their home community for their retailing needs.

When classified by household age group according to the age of respondent, the proportion of purchases in the home community increased somewhat with age level (*Figure 4*). For those respondents who were 65 or over, more than two-thirds of their purchases were made in the home community, as compared to less than 60 percent of those respondent households in the under 45 age bracket. Willingness to travel further for goods and services appears to decline as the household ages.

The presence of a larger town (than respondent's own community) within a one-hour driving time also was found to influence the level of retail dependency households had on their own community. For those respondent households that had a larger community than their own within an hour commute time, their percentage of retail goods and services bought locally was 56 percent as compared with 80 percent for those who did not have the option of a larger community within an hour drive. Moreover, those with this option reported purchasing an average of more than 30 percent of their household retail goods and services in that larger, nearby community. Apparently, the retail pull of larger communities is particularly strong within this driving radius, and may be associated with larger rural job commuter distances.

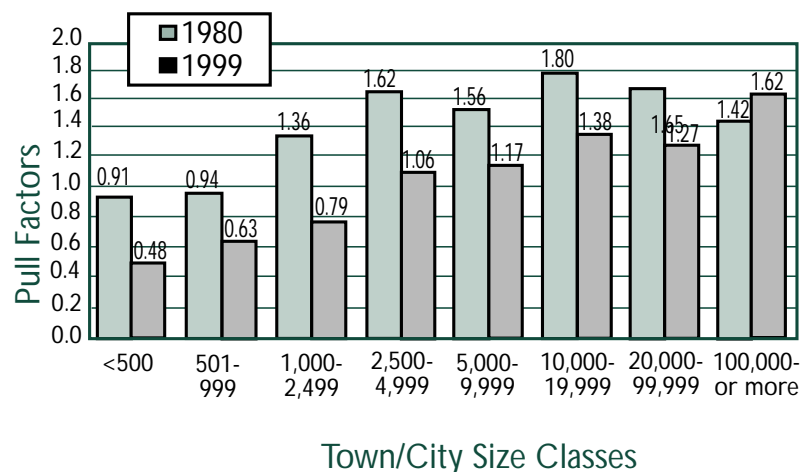
Income and educational levels of households did not appear to influence their retail dependency on the local community. Across the household income classes, there was no significant difference in the reported percentage of

**Figure 1. Average retail pull factors by county classes in Nebraska, 1980 and 1999\*.**



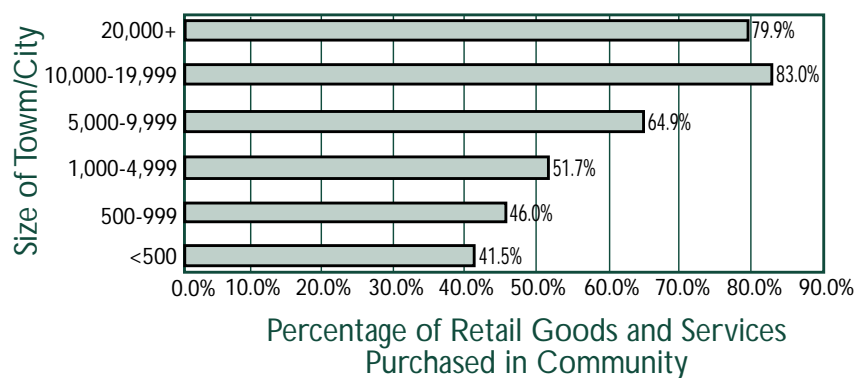
\*Based on taxable sales as reported by the Nebraska Department of Revenue.

**Figure 2. Average retail pull factors by town/city size class in Nebraska 1980 and 1999\*.**



\*Based on taxable sales as reported by the Nebraska Department of Revenue.

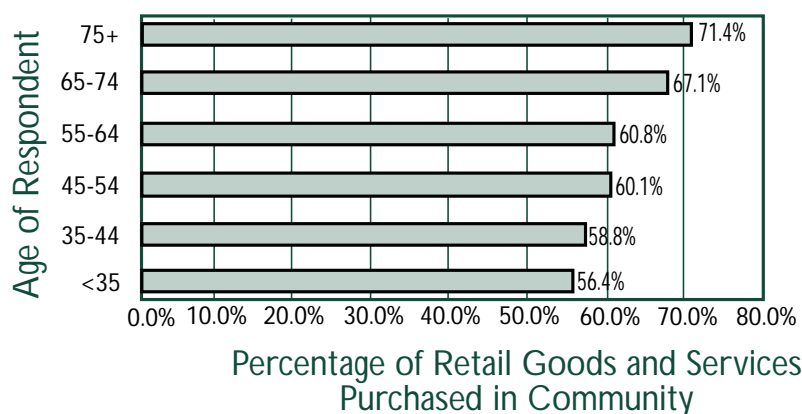
**Figure 3. Percentage of household retail goods and services bought in own community, by size of community, Nebraska 2000\*.**



\*Source: The 2000 Nebraska Rural Poll.

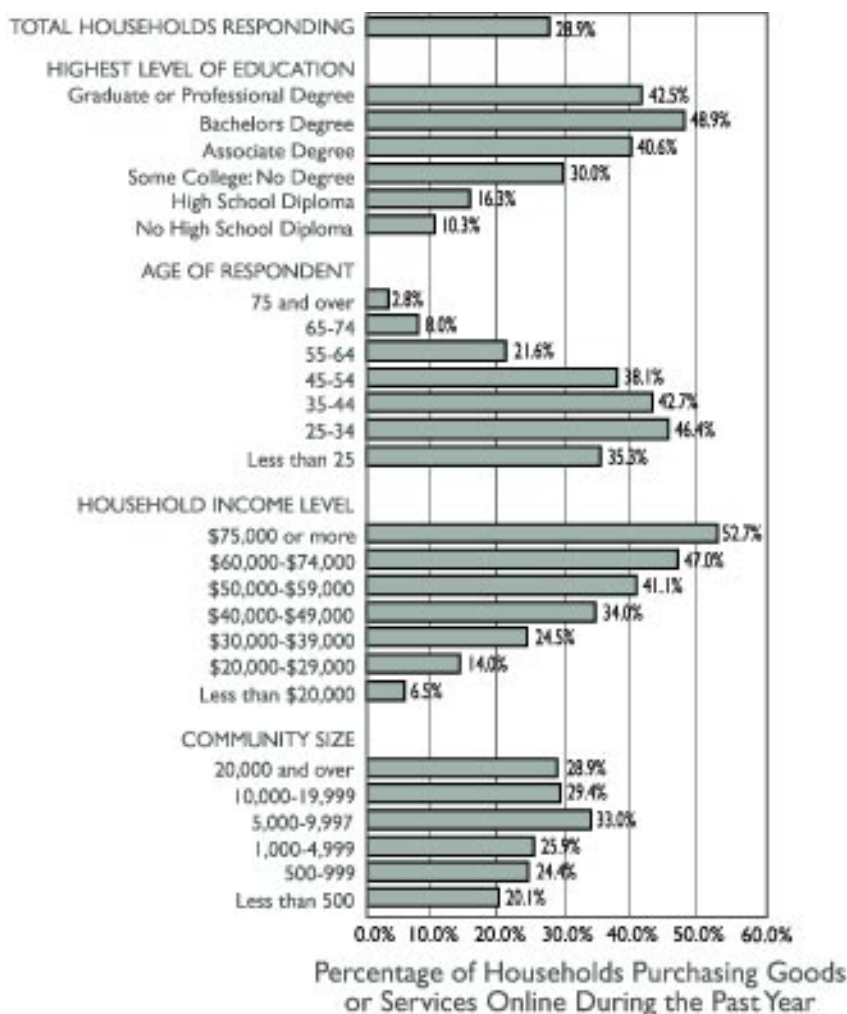


**Figure 4. Percentage of household retail goods and services bought in own community, by age of respondent, Nebraska, 2000\*.**



\*Source: The 2000 Nebraska Rural Poll.

**Figure 5. Percentage of respondent households who have used the Internet to purchase goods or services online during the past year, by selected characteristics, Nebraska, 2000\*.**



\*Source: The 2000 Nebraska Rural Poll.

retail goods and services acquired locally. Likewise, there was little difference across the household classes by educational level.

Place of residence, however, did impact the level of retail dependence upon one's own community. Households located within the city limits of the community itself tended to purchase the highest percentage of goods and services locally—64 percent. This was in contrast to nonfarm households outside the city limits purchasing just 57 percent locally, and farm households who reported an average of 49 percent of their retail purchases being from their local community.

## The Impact of E-Commerce

Besides the ever-increasing retail competition from larger retailers in the larger trade centers, the state's smaller towns also face another dynamic that is now staging to have a potentially profound impact on retailing everywhere—e-commerce. Today, virtually any consumer may consider this option to “brick-and-mortar” retailing, much like catalog retailing changed buying patterns nearly a century ago. How this works though in the retailing patterns of rural America remains to be seen, but the implications could be significant.

For the households surveyed in the 2000 Rural Poll, we asked a number of questions which provided a “first-time” profile of present participation in e-commerce.

Of the total number participating in the 2000 Rural Poll, 28.9 percent reported having someone in their household using the Internet to purchase goods or services online during the past year (Figure 5). However, the incidence of Internet use for purchasing items varied widely across the various household types represented in the Poll as reflected by educational attainment level, age, and household income. In fact, if one were to profile the e-commerce users, it would

certainly tend to be the more educated, younger households at the upper end of the household income classes who live in larger communities. Certainly, access to, understanding of, and interest in the technology of e-commerce may all be contributing elements to this profiled household user.

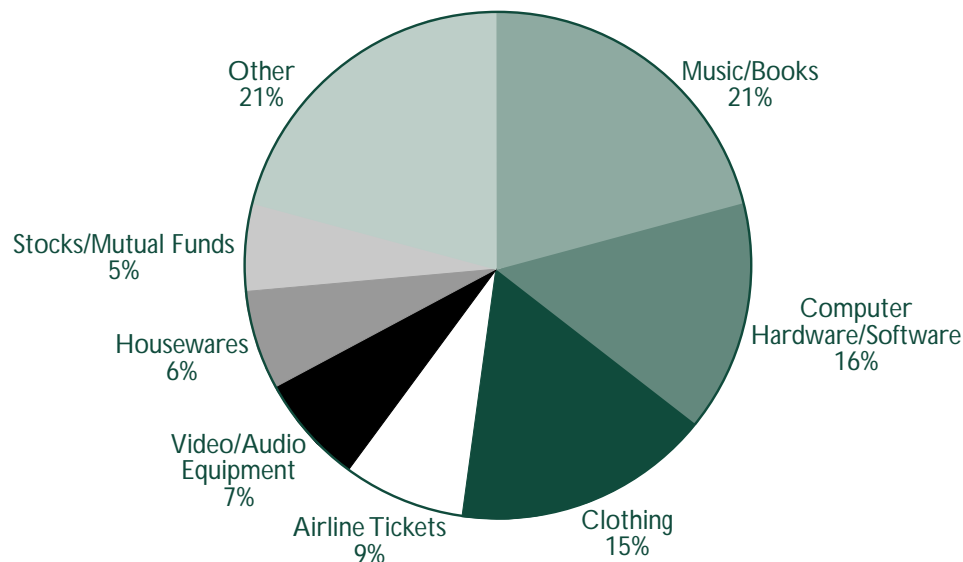
What is being purchased via e-commerce? Music/books was the largest class, followed by computer hardware/software and clothing (*Figure 6*). The items reported by respondents closely parallel the patterns of purchases nationwide, items which have a particular propensity to attract and efficiently serve a retail audience. Interestingly, these are not necessarily retail items for which retailers in smaller rural communities would normally compete. Therefore, e-commerce may not pose as much of a threat as initially thought. In fact, this study indicated that households were using online purchases more as a supplement to their typical retail purchase patterns than as a substitute.

When asked about their intended purchases online in the coming year, nearly two-thirds of the households, 63 percent, did not plan to make any purchases. Of the remaining 37 percent, these households anticipated spending an average of \$475 online in the next 12 months. So, for all households represented in the 2000 Nebraska Rural Poll, the average anticipated annual expenditure online in the coming year would be about \$175. Given average household expenditures of about \$20,000 per year, this amount represents less than 1 percent of the total “retail pie,” hardly a serious threat to retailers vying for rural household business.

## Some Implications

Historical retail expenditure patterns, as well as current rural household buying patterns, suggest a mobile and shrewd retail consumer who configures household retail goods and services from a variety of locations and sources. Long-

**Figure 8. Types of purchases made online (using the Internet) over the past year, Nebraska, 2000\*.**



\*Source: The 2000 Nebraska Rural Poll.

term loyalty to a particular merchant and/or retail community is not as influential as it once was. This makes for a very competitive retail environment, and one that often can put the smaller retailers and the smaller communities at a relative disadvantage.

Nevertheless, local availability and convenience of retail goods and services remains an important consideration for the consumer whose most limited resource may be time. This may explain why rural households are still relying heavily on nearby retailers if not those in their own local community. Even in those communities of less than 500, residents buy over 40 percent of their goods and services locally. For the individual retailer and the retail community who can respond to these consumer-driven needs with quality goods and follow-up service after the sale, there is indeed, a potentially viable retail future. Moreover, the personal touch, an attribute which “big-box” retailers strive for but never really meet, may be the small retailer’s “trump card” in the ever-changing retailing sector.

As for e-commerce, its current use patterns do not suggest a strong competitive threat for the typical rural retail community, since the nature of goods being purchased online are generally not those being offered in smaller retail centers. Consumers are currently using this medium more as a supplement to, rather than a substitute for, their conventional buying patterns.

If anything, perhaps e-commerce offers more of an opportunity than a threat for particular retail establishments in rural areas whose clientele was once limited by geographic distance. For unique types of goods, retailers may be able to tap a virtual national, or even international, market from the most remote headquarters site. And while few will ever attain the level of Nebraska’s own Cabela’s in terms of customer volume and economic success, the door for economic opportunity in unique niches remains open.

*For more information, please e-mail Bruce Johnson, [bjohnson2@unl.edu](mailto:bjohnson2@unl.edu); or John Allen, [jallen1@unl.edu](mailto:jallen1@unl.edu).*



# Are there opportunities to enter production agriculture today?

by David J. Goeller

**F**ourteen states were represented at the National Farm Transition Network conference held at Pipestone, Minnesota. Participants representing universities, nonprofit organizations, and state departments of agriculture from coast to coast gave the conference a national perspective. Many of the speakers told of the same situation — waiting lines of “want-to-be” beginning farmers/ranchers, but few retiring producers interested in helping or cooperating with potential farmers. This was especially true if the retiring farmers were not related to or didn’t previously know someone who wants to begin farming.

Agricultural Census data for Nebraska contained in *Table I* document a trend that has taken place regarding the age of Nebraska’s farmers and ranchers. The number under 35 has steadily decreased from 13,436 (22.30 percent) in 1982 to 5,531 (10.75 percent) in 1997, while the number of farmers/ranchers over 65 has steadily increased from 8,777 (14.57 percent) in 1982 to 12,391 (24.08 percent) in 1997. Simply put, in 1982 there were approximately 1 1/2 farmers under 35 for every farmer over 65. In 1997 the relationship of younger farmers to older farmers had reversed, with about 2 1/4 farmers over 65 for every farmer under 35.

As the proportion of farmers in the over 65 age group has increased, ownership of agricultural assets has become more concentrated. The over 65 age group, according to the 1997 Agricultural Census data, owns slightly over \$7 billion of Nebraska’s agricultural land, buildings, machinery, breeding cattle and breeding hogs, up from nearly \$5 billion in 1992.

Let’s assume that those in the over 65 age group will transfer their assets to someone else over the next 10 years. That would require just over \$80,000 per hour to change ownership every hour of every

day, seven days a week, for the next 10 years. The vacuum created by the retirement of these Nebraska producers is going to be filled by someone. Will it be filled by existing producers who will continue to expand? Or, is there potential to bring new farmers/ranchers into agriculture?

Many factors have contributed to the declining numbers of younger farmers/ranchers entering agriculture. Certainly one barrier has been the capital intensive nature of the industry. Land cost has steadily increased since the dip in the mid

**Table I. Nebraska farm and ranch operations.**

Operator’s Age	1982 Farmers	%	1987 Farmers	%	1992 Farmers	%	1997 Farmers	%
<b>Under 35</b>	<b>13,436</b>	<b>22.30</b>	<b>12,609</b>	<b>20.84</b>	<b>8,877</b>	<b>16.77</b>	<b>5,531</b>	<b>10.75</b>
35 to 64	38,030	63.13	37,054	61.24	32,735	61.85	33,532	65.17
<b>Over 65</b>	<b>8,777</b>	<b>14.57</b>	<b>10,839</b>	<b>17.92</b>	<b>11,311</b>	<b>21.37</b>	<b>12,391</b>	<b>24.08</b>
Total Farmers	60,243		60,502		52,923		51,454	

1980s. Cash rent for land is extremely competitive in most regions of the state. Machinery and equipment costs also have risen dramatically. Narrowing profit margins for most commodities produced in Nebraska, coupled with higher family living costs, has created a less attractive comparison to nonfarm job opportunities. Often, nonfarm employment offers the allure of a higher standard of living with more “free time” and reduced financial risk. Farm families, like the general population, are smaller today than in the past. Fewer children are born, thereby reducing the potential for future farmers. The 1980s produced large levels of stress for many Nebraska families, causing many farm parents to discourage their children from following in their footsteps.

In spite of the economic climate in agriculture, in spite of the barriers, and in spite of those that would discourage young people from pursuing a career in production agriculture, there are many Nebraskans who would welcome the challenge that production agriculture offers. Carving out a start in farming or ranching is definitely not for the faint of heart, but there are those that are finding a way to make it work, and there are more that would like to try.

So what is being done to assist those that would like to enter agriculture? Several programs offer assistance to qualified producers. Many beginning farmers are using one or more state and federal programs to get that needed edge for the start.

**Farm Service Agency (FSA)** targets several loan programs to beginning farmers and ranchers. Loans are available for annual operating expenses, as well as machinery, breeding livestock and land purchases. Longer repayment periods, plus lower interest rates, make these programs quite attractive to those beginning operators who can qualify. For more information contact your local FSA office.

Carving out a start in farming or ranching is definitely not for the faint of heart, but there are those that are finding a way to make it work, and there are more that would like to try.

**Nebraska Investment Finance Authority (NIFA)** offers a program that creates a tax exempt status for interest earned by lenders who make qualified loans to beginning farmers. This allows the lender to pass on the savings in the form of a lower interest rate on a beginning farmer loan. For information, call (800) 204-6432.

**Land Link** is a program administered through the office of the Center for Rural Affairs. Land Link offers a data base clearinghouse for farmers and ranchers. It attempts to match retiring farmers with those wishing to enter farming. For information, contact Joy Johnson at (402) 846-5428.

On January 1, 2001 the **Beginning Farmer State Tax Credit** will go into effect. This program is intended to give qualifying beginning farmers who wish to rent agricultural assets an edge. The program gives qualifying owners of agricultural assets a 5 percent state income tax credit if they enter into a three-year rental agreement for land, machinery, livestock, or facilities with a qualifying beginning farmer/rancher. This doesn't have a direct impact on the profitability of the beginning farmer, but it does help to encourage landlords to take a risk and give the beginning farmer a chance to get started. For information, call (402) 471-6890 or (800) 446-4071.

Nebraska Cooperative Extension offers a program called **Returning to the Farm**. It is primarily for students and their parents who want to farm

together, but it is open to any multi-generation farming or ranching family. It is conducted annually on the University of Nebraska East campus in Lincoln, and biannually at the Nebraska College of Technical Agriculture at Curtis. Call (800) 535-3456 for additional information.

The University of Nebraska offers a program that works with both beginning farmers and retiring farmers. Confidential one-on-one assistance is available to help producers and would-be producers fill out a loan application, develop a feasible cash flow, budget family living expenses, establish goals, create a business plan or assist in a generational transfer of property. For information contact (402) 472-0661.

Should a young person enter agriculture today? Many will find that they may need to support their farm income with an off-farm job for a period of years. Some may produce commodities for a niche or organic market. Contracts will give some the stability they need to get started. They may need the assistance of a family member or neighbor to get started. It may be necessary to begin on a smaller scale and grow slowly. It will most likely be difficult. Many will succeed, but some will fail. Are there viable opportunities to get into production agriculture today? One thing is for certain: The answer to this question will impact families, neighborhoods, communities, schools, churches and all of Nebraska.

*For more information, please e-mail David Goeller, [dgoeller2@unl.edu](mailto:dgoeller2@unl.edu)*

# Carbon sequestration

by Glenn A. Helmers

The emission of carbon dioxide and other greenhouse gases into the atmosphere is credited with impacting global warming and associated environmental concerns. *Carbon sequestration*, a term increasingly being heard in agricultural and environmental circles, refers to removing atmospheric carbon and placing it in stable storage. Cropping agriculture, grassland, and forestry are frequently mentioned as carbon storage alternatives.

Interest in carbon sequestration and carbon “credits” for specific farm practices significantly increased following the Global Warming Conference at Kyoto, Japan in 1998. The Kyoto treaty has not been ratified by the U.S. Senate, and even though many believe the treaty has flaws, and many are not convinced global warming is occurring, the carbon sequestration issue has sparked the interest of policy makers, environmentalists, industrialists, farmers, and others.

Many industries emit considerable carbon and the costs of reducing such emissions, as required under the Kyoto treaty, are estimated to be very high. One alternative to reducing carbon emissions is the “purchase” of carbon reducing “credits.” One credit, which has the potential to balance carbon emission, is storing carbon via agricultural activities.

Even though the agriculture sector has potential to earn carbon storage or “sink” credit, the Kyoto protocol only remotely addressed the possibility of including cropland soil sequestration. Considerable research has focused on the potential impacts of carbon sequestration due to forest creation, re-establishment, and destruction. Less research has been devoted to carbon retention resulting from grassland and cropland activities. Regardless of the outcome of the international dimensions, many are convinced that some nations will independently pursue the goal of carbon emission reductions or link with other nations in joint efforts using agriculture as a participant.

Soil organic matter is a repository for carbon and can be a source of carbon to the atmosphere or a sink where atmospheric carbon is deposited. Depending on the type of organic matter (whether humus, manure, stubble, or litter), organic matter is between 40 and 60 percent carbon. Improved forest, range, and crop management practices can potentially improve carbon retention.

Even though growing crops is less effective in restoring carbon to soil as compared to grass and trees, carbon can be sequestered by cropping through the build-up of organic matter. One practice,

which reduces the oxidation of organic matter, is reduced tillage, because exposing and stirring the soil increases the oxidation process. In addition, considerable differences exist among crops and cropping systems with respect to increasing carbon levels in the soil. The impact of fertilizer, especially nitrogen, on carbon storage in agriculture is important because the industrial production of nitrogen itself leads to carbon emissions. Thus, to the degree that increased field crop application of nitrogen increases carbon retention, the fertilizer manufacturing process subtracts from that carbon gain.

## Environmental Contracts

Trading credits or premiums for activities that result in environmental degradation is neither a new nor little used mechanism. While interest in trading carbon enhancing activities for carbon emitting enterprises is relatively recent, markets for other environmental concerns have been successfully observed. Already, there is strong interest in developing carbon contracts between U.S. agriculture and other nations. Trans Alta Corporation of Canada has attempted to purchase up to 2.8 million tons of carbon credits from farms in the U.S. through the IGF insurance company.

A program that rewards farmers for specific practices requires addressing a number of institutional issues, in addition to well verified knowledge of soil carbon changes for very specific practices, and the translation of those into necessary economic incentives. A concern frequently heard is whether farmers would receive benefits for past and existing positive practices. Should only future change be rewarded, the issue of how and if to reward those who previously improved soil carbon levels becomes important.

One concern over using soil carbon sequestration in meeting the Kyoto requirements is how to verify that carbon is actually being sequestered. Currently, methods of testing soil carbon levels are expensive, but it is hoped that both remote sensing and in-field low cost instruments will accurately account for carbon changes. It is unlikely at this point that standards can be developed for carbon change related to specific field practices (crop tillage system, fertilization level) apart from field measurement.

## Cropping System Analysis

Whether cropping agriculture will be a major contributor to carbon sequestration depends on the carbon retention performance of alternative crops and tillage systems. In addition, the economic performance of each crop and tillage alternative is important to whether producers will adopt practices that increase soil carbon retention. In this section, research is summarized related to the differences in carbon sequestered by different cropping and fertilizer systems and their relative net returns.<sup>1</sup>

Using a 1984-98 University of Nebraska-Agricultural Research Service USDA experiment of cropping systems/fertilizer levels, carbon changes and costs and returns were estimated for 21 cropping and fertilizer systems in eastern



*Properly managed organic matter, such as the stubble Glenn Helmers is measuring here, can improve carbon retention.*

Nebraska. Carbon changes for each system were paired with estimated net returns for the respective systems.

Crops studied included corn, grain sorghum, soybeans, and oats/red clover. The seven basic sequences of these crops included 1) continuous corn, 2) continuous grain sorghum, 3) continuous soybeans, 4) a corn-soybean rotation, 5) a grain sorghum-soybean rotation, 6) a rotation sequence of corn, soybeans, corn, and oats/clover, and 7) a rotation sequence of corn, soybeans, grain

sorghum, and oats/clover. Rotations include a proportionate level of each crop in the sequence for each year. The above systems can be noted as C, GS, SB, C-SB, GS-SB, C-BC-O, and C-B-GS-O respectively. Oats were harvested for grain, but clover was not harvested. For each of the seven cropping systems, three (noted as 1, 2, and 3) levels of nitrogen fertilizer levels were applied. For corn and grain sorghum, the levels were 0, 80, and 160 lb./ac. For oats and soybeans, the levels were 0, 30, and 60 lb./ac. Hence, a total of 21 systems were examined involving

<sup>1</sup>See Helmers, Glenn and Gary Varvel, "Economic Tradeoffs of Carbon Sequestration Resulting from Alternative Cropping Systems." (Available from Glenn Helmers.)

seven systems with each crop of the system fertilized at the same level (1, 2, or 3). Disk tillage was used throughout the period as the basic and preparation treatment.

Net returns for each cropping system for each year were estimated by using the experimental yields for each system, crop prices, and estimated operating costs. Carbon sequestered and net returns estimated for each cropping/fertilizer system are presented in *Table I*.

The highest level of fertilizer led to the highest net return in four of the seven systems (C, GS, GS-SB, and C-SB-GS-O).

The second fertilizer level maximized average net returns in two cases (C-SB and C-SB-C-O), while the zero maximized average net returns for continuous soybeans (SB).

It can be seen from *Table I* that only nine of the 21 systems had positive carbon gains over the period. Only two systems (C-SB-C-O and C-SB-GS-O) had positive carbon gains over the three fertilizer levels. With the exception of the SB system, increased nitrogen led to larger carbon increases or less carbon declines. The four-year systems had uniformly positive carbon accumulations. Continuous soybeans (SB) and the two

two-year rotations involving soybeans (C-SB and GS-SB) involved carbon losses. Soybeans clearly appear to be associated with carbon losses, continuous feed-grain systems are intermediate depending on fertilization, while the four year rotations which involve oats/clover are consistently positive in carbon storage.

It is believed that the C/N ratio is important to carbon sequestration. When high, microbial activity is limited and carbon is retained more than where the C/N ratio is low. In a C-SB rotation following the soybean crop, carbon is lost because of high nitrogen (nodule development) and little residue (carbon). Thus, soybeans tend to be associated with negative carbon sequestration.

**Table I. Estimated annual average returns over operating costs and carbon change in 0-6" soil depth (1984-98).<sup>1</sup>**

	Net Returns \$/ac.	C/Ac.
C <sub>1</sub>	66.97	-2384
C <sub>2</sub>	168.10	-964
C <sub>3</sub>	189.10	563
GS <sub>1</sub>	69.66	-214
GS <sub>2</sub>	140.68	446
GS <sub>3</sub>	148.80	1161
SB <sub>1</sub>	145.06	-1607
SB <sub>2</sub>	134.44	-1116
SB <sub>3</sub>	132.44	-1643
C-SB <sub>1</sub>	165.98	-1125
C-SB <sub>2</sub>	182.11	-1295
C-SB <sub>3</sub>	178.82	-652
GS-SB <sub>1</sub>	152.46	-1366
GS-SB <sub>2</sub>	154.91	-804
GS-SB <sub>3</sub>	169.56	-580
C-SB-C-O <sub>1</sub>	145.63	304
C-SB-C-O <sub>2</sub>	160.65	366
C-SB-C-O <sub>3</sub>	158.42	928
C-SB-GS-O <sub>1</sub>	132.68	223
C-SB-GS-O <sub>2</sub>	149.27	71
C-SB-GS-O <sub>3</sub>	128.53	723

It is important to note that in 1992, a somewhat small change in the conventional (disk) tillage system was made. This consisted only of a size change in the disk. This changed the stirring of the soil and immediately resulted in reduced carbon levels. However, after 1992, patterns in carbon storage which occurred prior to 1992 reoccurred.

### Limitations

It must be stressed that the relationships observed in this study are derived from only one field experiment. Additional studies are needed. Further, this study does not examine different tillage systems. The sensitivity of carbon retention to only slight changes within a tillage system suggests that without actual measurement of carbon a high degree of confidence cannot be placed in how carbon levels change simply by knowledge of the cropping system, tillage, system, and fertilizer level.

<sup>1</sup>Numbers refer to nitrogen at three levels with the level used for all crops of the system.

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# Food system evolution: a forerunner to change in production agriculture?

by A.L. (Roy) Frederick

**T**he single biggest change in the history of meat retailing. That's how *Cattle Buyers Weekly* describes what IBP, Inc. is about to do. Sometime in late 2001, the world's largest meat packer will roll out its "Thomas E. Wilson" brand of beef and pork products. As many as 130 meat products, including fresh steaks and chops, will carry that brand name.

The initiative being taken by IBP is symbolic of changes underway in the food system.

If successful, attaching a brand name to meat products previously marketed as commodities will increase IBP's profits. But that's just the start of potential impacts.

The packer has a contract with Wal-Mart Stores to sell the branded products. You can be certain that the mega-merchandiser also expects to make a profit doing so. That means well-stocked meat cases with products of consistent quality, backed by significant spending on promotion and advertising.

To keep both packer and retailer happy, animals moving through IBP's packing plants will need to meet certain standards relating to weight, grade, cutout value and other quality characteristics. Can the packer assume that quantity and quality standards will be met by depending wholly on the daily

spot (cash) market? Probably not. Are producers who meet the packer's quality specifications willing to take whatever is offered in the spot market? Probably not. But is there universal agreement on the desirability of changes occurring in meat packing and elsewhere in the food-supply chain? Definitely not.

The answer to the last question sets the stage for what has become a major agricultural policy issue. At its core, it has to do with who controls the food system and how profits are distributed within the system. Beyond that, specific questions relating to competition, concentration and contracting are raised. Sometimes it is simply referred to as the "structure debate."

## Structure of Agriculture: Setting and Perspective

The structure of agriculture has to do with how farms and agribusinesses are organized and how they relate to each other.

Debate on structural issues embraces competition and efficiency on one hand, but fears of market power and monopolistic profits on the other. It is not a new phenomenon.

For more than a century, there have been periodic concerns about a handful

of nonfarm businesses gaining too much power in the market place. In the late 1880s, four major meatpackers—Swift, Armour, Hammond and Morris—accounted for two-thirds of the U.S. beef supply. Congress passed the Sherman Antitrust Act in 1890 partly because of farmers' concerns over concentration in the packing industry. This seminal legislation outlawed conspiracies in restraint of trade and made it a felony to monopolize or attempt to monopolize any part of trade.

Later, in 1914, Congress passed both the Federal Trade Commission (FTC) Act and the Clayton Act. Each act speaks to competition in the marketplace. Section 5 of the FTC Act prohibits "...unfair methods of competition," while Section 7 of the Clayton Act forbids mergers and acquisitions whose effect "...*may be*" (italics added) to substantially reduce competition or tend to create a monopoly."

It didn't take long for the fledgling FTC to swing into action. By 1918, the agency concluded that the five largest meat packing firms had monopolistic control over the livestock industry. This included ownership not only of packing and processing facilities, but financial interests in stockyards, transportation and distribution networks, and market outlets and retail stores. The Department of Justice filed a criminal antitrust suit

against the packers, resulting in a 1920 consent decree. The consent decree required packers to cease activities relating to consumer markets and to divest their investments in stockyards and railroad terminals.

The FTC findings also paved the way for passage of the Packers and Stockyards Act in 1921. Section 202 of that act prohibits unfair, deceptive, discriminatory, and monopolistic trade practices in the livestock, poultry and meat industries. Although focused on only one part of the food sector, this mandate is stronger than anything offered in earlier legislation. However, for various reasons, Section 202 has rarely been used. Perhaps the most important is that the conditions that gave rise to Section 202 seemed to fade away in the years immediately after its passage. For that reason, USDA, the executive department charged with administering the Packers and Stockyards Act, chose to focus most of its attention on other parts of the act.

The new law responds to fears that buyer concentration and contracts were limiting the usefulness of information from traditional cash markets.

These long-standing laws have not kept structural issues from returning to the top of the agricultural policy agenda in subsequent years.

For example, in the early 1960s, the federal government undertook a comprehensive study of food processing and retailing. It focused on declining competition within the sectors and the potential impacts on both producers and consumers. Although no landmark legislation resulted from that study, it symbolized a renewed vigilance regarding undue market power.

In the late 1970s, Secretary of Agriculture Bob Bergland held a series of hearings across the country on agricultural structure issues. Input was extensive and many policy prescriptions were offered. However, any possibility of channeling the hearing responses into federal legislation faded away with a change in administrations after the 1980 election.

More recently, federal legislation passed in 1999 requires mandatory reporting of prices paid for livestock by packers. The new law responds to fears that buyer concentration and contracts were limiting the usefulness of information from traditional cash markets. However, implementation of the law has been more challenging than expected.

Policy regarding structural issues has not always been limited to the federal government. In 1982, for example, citizens of Nebraska passed Initiative 300, a constitutional amendment that

prohibits nonfamily corporations from engaging in farming, ranching or livestock feeding. More recently, in 1999, the Nebraska Legislature passed LB 835, a bill that outlawed packer feeding. (Other provisions of the bill were preempted later that year by the federal legislation noted above.)

Over the years, dozens of studies have been conducted on agricultural structural issues, mostly by economists and lawyers associated with universities or the federal government. The purpose of these studies generally has been to

determine why changes are occurring and to assess the impact of changes on various individuals—ranging from producers to consumers—within the food system. Among other factors, our capitalist economic system, technology, tax policy, and federal price- and income-support policy are thought to have contributed to structural change.

As for impacts, the studies reach no clear conclusions. Some research concludes that structural change has improved production efficiency and brought lower prices to consumers. However, roughly an equal number of studies conclude that business concentration and control tend to bring monopoly or near-monopoly profits to the largest firms. Few researchers dismiss structural change as something that is not even a potential concern.

## The Nature of Competition

One of the leading experts on the organization, conduct and performance of the American economy, William G. Shepherd, says that competition is “...a complicated process within distinct markets, and it comes in many types and degrees.” Both competition and its polar opposite, monopoly, represent sophisticated, changed and shaded conditions. Neither is black, or white.

Shepherd says “effective competition” is a desired standard for any sector of the economy. By that, he means that an industry should have numerous competitors, and they should be able to apply mutual pressures on each other. No one firm dominates, and entry by competitors is relatively easy. Importantly, he suggests that competition can be quite ineffective when an industry begins to move away from these standards.

The core issues of effective competition can be summarized as:

1. All firms seek higher market shares in order to gain higher profits.

2. When these firms' struggles hold each other in check, effective competition exists. It yields low costs, low prices, rapid innovation and wider benefits.

3. If one or more firms come to dominate, competition may be ineffective. The market power gained by the firm or firms causes higher prices and restricted output, and it imposes social costs: inefficiency, slower innovation, unfair shifts of income and wealth, reduced freedom of choice and still others.

4. These monopoly costs may be offset if there are large scale economies or superior performance by the dominant firms.

We normally think of a firm's structure as influencing its conduct and performance. In a monopoly, one firm dominates. Unless it is a benevolent monopoly (described in item four), it is a concern for the reasons outlined in item three. Two or three dominant firms may be equally disconcerting if they do not compete strongly with each other and/or entry of new firms is limited by capital requirements or other factors.

Sometimes the linkage between structure, conduct and performance is reversed. A firm that is highly efficient or innovative also may be highly profitable. Its market share increases. Other firms have difficulty competing, because the performance of the market leader is so dominating. The Wal-Mart phenomenon is a case in point. Wal-Mart has come to dominate retailing, mostly because its performance as a retailer has been exceptional. If the Thomas E. Wilson venture is successful, it undoubtedly will help both IBP and Wal-Mart become even bigger factors in their respective markets.

## Price Determination and Profits

Structure is driven mostly by economic considerations. Those who provide products and services, including

farmers, processors, wholesalers and retailers, want to make a profit. Consumers want the lowest possible price for the goods and services they consume. Generally, government does not intervene in the process of price determination, even though some entities in the production-to-consumption chain have more market power than others. However, as Iowa State University economist Neil Harl has pointed out, for the economic system to function properly, it is critical to have:

- policies in place to deal with cost externalities such as odors and stream and water pollution; and
- a system of market protection (antitrust) to penalize collusion and to prevent undue concentrations of economic power.

A major challenge in the present environment is to determine whether there is (or is likely to be in the future) an "undue concentration of economic power" in the farm input supply, food processing and food retailing sectors.

## Concentration in Production Agriculture and Allied Industries

Production agriculture is one of the least concentrated (closest to a purely competitive economic model) of all economic sectors. With just over 2 million farms and ranches nationally and about 51,000 in Nebraska, most producers have little ability to determine the price or other terms of trade for the commodities they sell. They are price takers, not price makers.

Producers, however, must deal with input suppliers, processors and handlers that are many fewer in number, especially within a local trade territory. While this does not automatically mean that competition is lacking among agribusinesses or even that they are profitable in the short run, few producers

doubt the ability of these firms to dictate at least some terms of trade. At the heart of current structural concerns is the fear that long-term profit opportunities in the food sector will tilt mostly toward agribusinesses, not producers.

The term "concentration" often is used in the context of how much of the market for a certain product is controlled by a relative handful of firms. A market where the four largest producers account for 50 percent of the market is much more concentrated than one where the top four account for 10 percent of the market.

Concentration occurs in a competitive economy because firms often realize cost reductions in the production or marketing of products as their operations expand. Firms may grow (and industries become more concentrated) through either internal growth (reinvesting profits in the firm) or by mergers and acquisitions. In turn, cost reductions can be passed along to consumers (thereby increasing the firm's share of the market), profit margins can be increased, or both.

In reality, firms in concentrated industries generally can't convert all their reduced costs to higher profits. Unless there are very high barriers to entry (patent protection, for example, can temporarily be such a barrier), another firm or firms will enter the industry or expand their operations to take advantage of profit opportunities. Competition in the personal computer industry during the 1990s is a case in point. Even with only a relative handful of major manufacturers (Dell, Gateway, Compaq, Packard Bell), computer prices fell significantly. Bottom line: Competition among computer manufacturers was sufficient to result in cost reductions being passed along to consumers.

Let's turn our attention now to concentration in the agribusiness sector, particularly food processing. Over the 30-

**Table I. Aggregate concentration in U.S. food processing.**

1967	1972	1977	1982	1987	1992	1997e
-Share of Valued Added Held by 100 Largest Food Processors-						
51	53	55	61	67	69	75
Source: Richard Rogers, "Structural Change in U.S. Food manufacturing, 1958 to 1997," paper prepared for ERS conference on Consolidation in the U.S. Food System, May 2000.						

year period, 1967 to 1997, the share of value added by the 100 largest food processors increased from 51 percent to 75 percent (*Table I*). Mergers accounted for much of the increase, but the disappearance of small processors was a factor as well. Average plant size increased for virtually every type of food processing. McDonald and Denabaly found the median increase in plant size to have been 100 percent over the 20-year period between 1972 and 1992. Such increases imply that economies of scale must have been generally available throughout the sector.

**Table II. Structural change in meatpacking.**

	1980	1985	1990	1995	1997	1998	
Concentration	Share of Slaughter in Four Largest Firms						
Hogs	34	32	40	46	54	56	
Steers/heifers	36	50	72	79	78	81	
Large Plants	Share of Slaughter in Large Plants						
Hogs	63	67	79	86	88		
Steers/heifers	24	53	66	81	80		
Source: USDA/GIPSA Notes: Large hog plants slaughter at least 1 million head, while large steer and heifer plants slaughter at least 500,000 head.							

The most dramatic increase in concentration within the food processing sector has been in meatpacking. The four largest firms accounted for only 36 percent of the steer and heifer slaughter in 1980. This compared to 81 percent in 1998 (*Table II*). Note that the increase was particularly dramatic from 1980 to 1990. According to McDonald, since the U.S. Census Bureau began reporting such data in 1947, no other manufacturing (processing) industry has experienced such a large increase in the four-firm concentration ratio (CR4) in such a short period of time.

**Table III. Concentration in grain and oilseed processing.**

Industry	Leading Firms	Four Firm Concentration			
		1977	1987	1992	1997*
Flour Milling	ADM, Conagra, Cargill, Cereal Food	33	44	56	62
Wet Corn Milling	ADM, Cargill, Staley, CPC	63	74	73	74
Soybean Milling	ADM, Cargill, Bunge, AGP	54	71	71	83
Cottonseed Milling	Anderson Clayton	45	43	62	
Malting	Conagra, Cargill, ADM, breweries	59	64	65	
Sources: 1977-92 concentration data from Census of Manufacturers. Identifies of leading firms, and 1997 concentration estimates, are from trade publications.					

The increase in the CR4 for hogs has been less dramatic but still significant over the same period of time.

Associated with change in the CR4 is the proportion of livestock being slaughtered in very large plants (at least 1 million hogs or 500,000 steers and heifers annually). The change for steers and heifers was particularly large, going from 24 percent of the total in 1980 to more than 80 percent 15 years later. Shifts in plant size likely are being driven by economies of scale, which creates an opportunity for more efficient processing. The question, however, is how much of this increased efficiency is being passed along to producers (in the form of higher livestock prices) or consumers (in the form of lower meat prices).

Work done by McDonald relating to beef farm-wholesale price spreads suggests that gains in plant efficiency were passed along to producers during the 1980s. However, during the 1990s, spreads have worked irregularly higher. At some point, the most recent trend could be cause for concern on the part of producers.

In addition, concerns have arisen regarding the social costs associated with large meat processing plants. The hundreds, if not thousands, of workers required for the largest plants often impose burdens on communities ranging from schools to health care to law enforcement. The burden becomes greater when language and cultural barriers come into play.

Some Nebraskans also have been intensely interested in structural changes in the grain merchandising and processing industries. CR4s, together with the leading firms in each industry are shown in *Table III*. Note the considerable overlap among firms for various processing sectors. This overlap cannot be explained easily by a desire to achieve economies of scale in processing. Rather, it is more likely that growth of several lines of business within a firm offers certain economies in merchandising and transportation. Risks also are spread. However, from a producer point of view, it may seem that agribusiness concentration is being narrowed to just a few firms, operating across a wide array of businesses.

## A Perspective on Antitrust Laws

Under the Sherman and Clayton Acts, three basic types of violations can occur. First, it is against the law for potential competitors to conspire to deny market access or otherwise suppress competition. Second, no firm may use predatory and/or exclusionary conduct to acquire or hold a monopoly in a

market. Finally, mergers and acquisitions (hereafter referred to as “mergers”) are prohibited if the effect would be to substantially lessen competition in a market.

Of the three potential violations, farmers and ranchers have been most concerned about mergers. In some cases, this concern is directed to the input side of agriculture, where mergers may limit the number of sellers of seed, chemicals and farm machinery. Alternatively, the focus may be on the number of buyers for crops and livestock after a merger occurs.

The Antitrust Division of the Department of Justice and the Federal Trade Commission share merger enforcement responsibilities (except for certain areas where the FTC’s jurisdiction is limited by statute). The unifying theme of their activities is that “mergers should not be permitted to create or enhance market power or to facilitate its exercise. Market power to a seller is the ability to maintain prices above competitive levels for a significant period of time.” Equally important, the same standards for evaluating market power are applied to the “buyer-side” of the market.

In a recent appearance before a congressional committee investigating agricultural concentration, John Nannes, Deputy Assistant Attorney General in the Antitrust Division, described merger-related investigations this way:

“We ordinarily seek to define the relevant markets in which the parties to a merger compete and then determine whether the merger would be likely to lessen competition substantially in those markets. In performing this analysis, the Antitrust Division and the FTC consider both the post-merger market concentration and the increase in concentration resulting from the merger. The Antitrust Division is likely to challenge a transaction that results in a substantial increase in concentration in a market that is already highly concentrated, although

appropriate consideration will be given to other factors, such as the likelihood of entry by new competitors....”

The reviewing antitrust agency may reach any of several conclusions after its investigation. First, the proposed merger raises no major anti-competitive threats and therefore is allowed to be consummated. Second, the merging parties agree to divest certain properties to another (competing) buyer. Lastly, litigation may be brought in cases where violations of the law appear to have occurred and voluntary divestiture or other proposed remedies have not worked.

Here are some recent examples of merger enforcement actions relating to agribusiness firms:

In 1998, the Antitrust Division investigated Monsanto’s proposed acquisition of DeKalb Genetics Corporation. Both companies were leaders in seed corn biotechnology. As a result of government action, Monsanto agreed to spin off a unit that provides the technology to introduce new genes into the corn seed. Monsanto also agreed to license its Holden’s corn germ plasm to over 150 seed companies so they can use it to create their own hybrids.

Also in 1998, Cargill proposed to purchase Continental’s domestic grain business. The parties were buyers and sellers in a number of markets, both in the United States and abroad. Fearing a loss of competition, the Antitrust Division required divestiture of several elevators and other facilities that would have been controlled by the combined company. Some were at major export points, with the remainder mostly at selected river and terminal markets.

More recently, in November 1999, the Antitrust Division investigated the proposed merger between equipment manufacturers New Holland and Case Corporation. The investigation was prompted by fear of dwindling competi-



tion within certain segments of the tractor market and for several types of hay and forage equipment. In the end, New Holland agreed to divest its large two-wheel and four-wheel tractor lines. In addition, Case closed out its joint hay and forage equipment venture.

In 2000, Monsanto abandoned its intended acquisition of Delta & Pine Land Co., a major cotton seed producer, after the Antitrust Division made an outright challenge of the proposed purchase. Federal investigators felt there would simply be too little competition in the cotton seed market if the merger was allowed to stand.

The threat of antitrust litigation is not a matter to be taken lightly. Two recent cases, while based on the violation of collusion—not merger—provisions are worth noting.

In 1996, the Antitrust Division prosecuted Archer Daniels Midland (ADM) and others for participating in an international cartel to control lysine prices. Lysine is an important additive in livestock and poultry feed. ADM pled guilty and the company was fined \$100 million and three of its executives were fined individually and sentenced to jail terms.

Then in 1999, F. Hoffmann-La Roche Ltd. was fined a “world record” \$500 million for conspiring to fix prices and allocate sales volumes on vitamins used as food and animal feed additives. BASF Aktiengesellschaft, its co-conspirator, was slapped with a \$225 million fine.

These two cases should not imply that the Antitrust Division focuses solely on high-dollar cases. Earlier in the 1990s, two Nebraska cattle buyers were successfully prosecuted for bid-rigging in connection with procurement of cattle for a meat packer. The case had begun with an investigation by USDA’s Grain, Inspection, Packers and Stockyards Administration.

Although not often used, the Packers and Stockyards Act gives authority to USDA to investigate noncompetitive behavior on its own. In fact, this authority appears to extend beyond conduct that might violate the Sherman or Clayton Acts. However, if GIPSA uncovers improper conduct, it must refer its findings to the Antitrust Division for investigation and enforcement. In short, it is quite a maze to maneuver from USDA to the Antitrust Division and (perhaps) eventually to a court of law.

Finally, several recent developments with regard to antitrust enforcement deserve mention.

In the summer of 1999, the Antitrust Division, the FTC and USDA, signed a memorandum of understanding to cooperate on matters relating to competitive conditions in the agricultural marketplace.

In September 2000, the General Accounting Office (GAO) released a report on the adequacy of GIPSA investigations regarding anticompetitive behavior in the cattle and hog markets. While five alleged violations of the Packers and Stockyards Act were identified between October 1, 1997 and December 31, 1999, the GAO found that the investigation process could be much more vigorous. Better planning and a heftier commitment to legal investigations were among its recommendations.

Subsequent to the issuance of the GAO report, Congress passed S. 3091, a bill to implement the recommendations of the report. In particular, the legislation calls for the Secretary of Agriculture to consult and work with the Department of Justice and the Federal Trade Commission to enhance USDA’s investigative effectiveness. This includes training for USDA staff who are or will be engaged in investigations of anti-competitive behavior.

## Policy Alternatives

A wide range of policy alternatives could be applied to structural change in the agricultural/food system. Some are more appropriate for the federal government, while others might originate within state governments.

Perhaps the place to begin is by acknowledging that one alternative is to do nothing. In essence, trends underway would be allowed to continue. Likely consequences would be a continued bias toward increased concentration, more contracting and a challenging cash market environment, particularly for smaller producers.

Alternatively, the following options might be considered at the federal level:

- Additional staff and other resources could be added to the Antitrust Division of the Justice Department and/or the Federal Trade Commission. A specific directive could be given to monitor mergers and potential abuses of market power in the food sector. (Under current arrangements, the FTC reviews potential mergers of food retailers, with the Antitrust Division handling almost everything else in the agricultural and food sectors.)

- USDA activities could be enhanced under Section 202 of the Packers and Stockyards Act. This would include strengthening the legal investigative capability of GIPSA, the administering agency. In short, GIPSA may come to look, think and act more like the Antitrust Division and the FTC.

- The mandatory reporting law passed in 1999 could be carefully reviewed and amendments proposed as

appropriate. For example, some supporters were disappointed that this legislation did not ban packer feeding of livestock. Perhaps that is an issue for further review in the not-too-distant future.

- A precise standard for market share in a particular sector might be considered. Informally, the Antitrust Division has indicated that the agency often does not become concerned about monopoly power until well over 50 percent of a market sector is controlled by one firm. Is this appropriate? Should a lesser maximum be set by law? What would be the implications for productivity and efficiency in doing so?

State laws must not conflict with either the federal or state constitutions or federal statutes. Otherwise preemptions occur. That's what happened with a significant part of the mandatory price reporting bill (LB 835) passed by the Nebraska Legislature in 1999. Notwith-

standing the limitations of state initiatives, here are some state policy options:

- The Nebraska Attorney General or the Nebraska Department of Agriculture could be given a directive to monitor specific structural changes. (The attorney general already has responsibilities with respect to the corporate farming prohibition in the Nebraska Constitution.) Findings could be made to appropriate state and federal policymakers.

- Nebraska could develop or adapt other states' checklists dealing with production and marketing contracts. This would include availability, pros and cons, issues, implications and pitfalls of various contractual situations.

- A standardized disclosure statement regarding key financial risks and responsibilities could be required for all contracts in the agricultural sector.

- Any contract to which an agricultural producer is a party could have a three-day cooling off period before it becomes final.

- More educational programs dealing with concentration, contracting, and other market alternatives could be offered through the University of Nebraska and other educational institutions in the state.

Like most other public policy issues, this may be the bottom line: If the will is strong enough, a way probably can be found to alter the direction of structural change in food sector.

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# Getting dirty down on the farm: daily labor and management under Initiative 300

by J. David Aiken

Article 8 §12 of the Nebraska constitution, known as Initiative 300 (I300), establishes several requirements for corporations to legally qualify as family farm or ranch corporations. Under one provision, a majority of the family farm or ranch corporation's shareholders must be family members, "at least one of whom is a person residing

on or actively engaged in the day to day labor and management of the farm or ranch." In *Hall v Progress Pig Inc.*, 259 Neb 407 (May 12, 2000) (*Progress Pig II*), the Nebraska Supreme Court ruled that where no family member resides on the farm or ranch, a family member must perform daily physical labor on the farm or ranch for the corporation to legally

qualify as a family farm or ranch corporation.

Progress Pig Inc. is an Otoe county farrow-to-finish swine operation, with the farmer owning all corporate stock. The owner, who lives on a farm three miles from the Progress Pig site, handles the operation's finance, management and marketing and works with production consultants. The Progress Pig production manager and other employees care for the swine. The owner was physically on site one to three days per week.

The owner contended that the I300 daily labor requirement included production activities in addition to physical labor, such as bookkeeping, marketing, etc. The district court judge concluded that the owner did provide labor and management for the farming operation, but ruled that the owner's labor was insufficient to qualify as the *daily* labor and management required by I300. The Supreme Court, in contrast, ruled that the owner's activities were primarily management, and that he provided only minimal physical labor (less than one hour per month). The Court ruled that the owner did not provide the daily labor required for nonresident corporate owners by I300.

Under I300, the owner will have to begin providing daily physical labor at the swine facility, sell the corporation



*Under I300, the owner will have to begin providing daily physical labor at the swine facility.*

within two years, or restructure the operation as a sole proprietorship or general partnership. If the owner could prove that he had *previously* met the daily labor and management requirement and therefore qualified for family farm corporation status, the owner might qualify for the 50-year requalification provision under I300, so long as his family retained a majority interest in the corporation.

The district court judge noted that daily labor requirements would vary depending on whether the farm were a crop operation or a livestock operation. Livestock would require daily care, while crop operations might require physical labor only seasonally (such as at planting or harvesting time). This issue was not addressed by the Supreme Court. However, future litigation seems inevitable regarding whether a nonresident corporate owner has provided sufficient daily physical labor to qualify for family farm corporation status, particularly where an older farmer is phasing out his or her physical labor contribution to the operation.

*Progress Pig II* was an important victory for family farm proponents. The lawsuit was originally filed in 1993, and plaintiffs (who include leaders of the Farmers Union and the Women Involved in Farm Economics) won an important procedural victory when the Nebraska Supreme Court ruled in *Hall v Progress Pig Inc.*, 254 Neb 150, 575 NW2d 369 (1998) (*Progress Pig I*) that the farmer-plaintiffs could enforce I300 under its citizen suit provision even after the county attorney had declined to bring suit. Nebraska Attorney General Stenberg earlier disqualified his office in the case because he had prepared

incorporation documents for Progress Pig Inc. while in private practice law prior to his election.

*Progress Pig II* has important implications, particularly for swine production in Nebraska where family farm corporate owners providing management and non-family employees providing the physical labor is common. The owners of these operations face the same choices as the Progress Pig owner.

*Cattle feedlots.* Most cattle feedlots are operated on the Progress Pig model, where the owner participates in management activities, and employees conduct most, if not all, of the animal care labor. This should not be an issue for most feedlots, however, if they were incorporated before November 2, 1980, the date Initiative 300 took effect. Farming and ranching corporations incorporated before this date are grandfathered by Initiative 300.

*Scattered farming sites.* Another related issue likely to arise in the future is whether a family member provides daily labor and management at each separate site that makes up part of the family farm or ranch corporation land base. If, for example, a family member does the farming on one tract but the hired man does the farming on a second separate tract, the family farm corporation might have to divest the second tract because it was not being farmed by family members. This could clearly be an issue where livestock facilities are deliberately kept separated and are operated by different personnel for biosecurity reasons. The owners of any farming or ranching operations that have significant hired labor should seek legal advice regarding Initiative 300 compliance.

*There also are family farm estate planning implications.* Often families may incorporate the farm or ranch when the parents finally consult an attorney to establish their estate plan. In many cases this may not occur until the parents are getting older. One estate planning recommendation stemming from *Progress Pig II* is that if the family wishes to establish a family farm corporation, it should do so while the parents (i.e. the current operators) can still meet the I300 family farm requirements by either residing on the farm or else by providing daily labor and management. If, for example, the parents move off the farm, then they (or other family members) must meet the daily labor and management requirement (or else move onto the farm) in order to qualify for family farm corporation status under I300. And, the older the parents become, the less likely it is they will provide daily labor and management. So the bottom line is that families should establish a family farm or ranch corporation while the parents either reside on the farm or actively participate in daily labor and management. Once a family farm corporation is legally established, the family will have a 50-year grace period to requalify if they fall out of compliance with I300 (such as when the parents move into town). However, if the family cannot initially qualify under I300 when the family farm corporation is established, they may have difficulty doing so later on (if they can at all).

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# Using experimental auction markets to study consumer demand: will consumers pay for their preferred beef flavor?

by Wendy J. Umberger, Dillon M. Feuz, Chris R. Calkins  
and Karen M. Killinger

**A**s agriculture marketing continues to evolve away from commodity marketing and towards individual product marketing, agricultural economists are becoming more involved in marketing research. One area of research is consumer acceptance and willingness to pay for new products or different product attributes. A number of these studies have used experimental auctions to elicit consumers' willingness to pay. Several different auction techniques exist, but most of the previous studies have used a variation of the second-price, sealed-bid auction, frequently referred to as a Vickrey auction.

With a Vickrey sealed-bid, second-price auction, each participant submits a written bid on a particular product. The highest bidder "wins" the auction and must purchase the product at the second highest bid. Second-price auctions have been used to determine the premium price consumers were willing to pay for vacuum packaged steaks versus overwrapped steaks (Menkhaus et al., 1992), to determine the value of genetically modified pork (Buhr et al., 1993), to elicit consumer willingness to pay for food safety (Hayes et al., 1995) and to place a value on consumer preferences for various quality attributes of fresh pork chops (Melton et al., 1996). In this study, an experimental auction market proce-

dure was used to elicit consumer willingness to pay for steaks with varying flavor.

Currently, the beef industry is trying to increase demand for beef by improving quality and consistency, thus, improving consumers' satisfaction with beef. In order to do this, the beef industry must create a product that meets consumers' expectations for beef palatability, and before they can do that they need to identify consumers' preferences for different palatability characteristics.

Palatability of beef and consumer taste preferences are based on: tenderness, flavor, and juiciness. Most recent research regarding consumers' palatability preferences focuses on consumers' perceptions and willingness to pay for tenderness (Savell et al., 1989; Morgan et al., 1992; Boleman, et al., 1997; and Lusk et al., 1999). However, recent studies show that beef flavor is of equal or greater importance to consumers. Neely et al. (1998) reported that both flavor and tenderness were highly correlated with consumer overall like ratings for beef steaks. Morgan et al. (1998) stated that flavor was more important than tenderness when consumers evaluated top round and top sirloin steaks. These results show that flavor is a key component of consumer satisfaction for fresh beef products.

Savell et al. (1989) found that consumers in both San Francisco and Philadelphia liked the flavor of USDA Choice beef over the taste of USDA Select beef; however, the leanness of Select beef appealed to consumers. Obviously, some consumers like the flavor of high marbled steaks, but fat content is still a significant consideration for consumers when purchasing beef.

While the studies discussed here provide information on the role of USDA quality grades in consumer evaluation of flavor, no effort was made to hold tenderness constant between different quality grades. By using steaks with similar tenderness values, one can focus on the importance of flavor alone without confounding the issue with tenderness. Determining consumer perceptions of beef flavor when tenderness is held constant could give the beef industry a better indication of the importance of beef flavor to the consumer. In addition, identifying the price premium that consumers are willing to pay for beef having the flavor they prefer also would be a valuable marketing tool for the beef industry.



## Objectives

The overall objective of this research is to identify whether consumers can perceive flavor differences due to marbling in beef steaks when tenderness is held constant, and to determine if consumers are willing to pay a premium for their preferred flavor. The specific objectives of this paper are: 1) to analyze consumer preferences for flavor in beef steaks by comparing highly marbled USDA upper two-thirds Choice versus low marbled USDA Select steaks; 2) to establish the price premium that consumers are willing to pay for their flavor preference; 3) to identify demographic variables that affect consumers' willingness to pay for beef flavor associated with marbling or quality grade.

## Procedures

Based on the second-price Vickery auction methodology, an experimental valuation process using a fourth-price Vickery auction was developed to elicit consumers' true willingness to pay for their preferred steaks. In this research, the fourth highest bid determined the market price with the top three bidders required to purchase steaks at the fourth highest (market) price. The fourth-price auction ensures more auction winners.

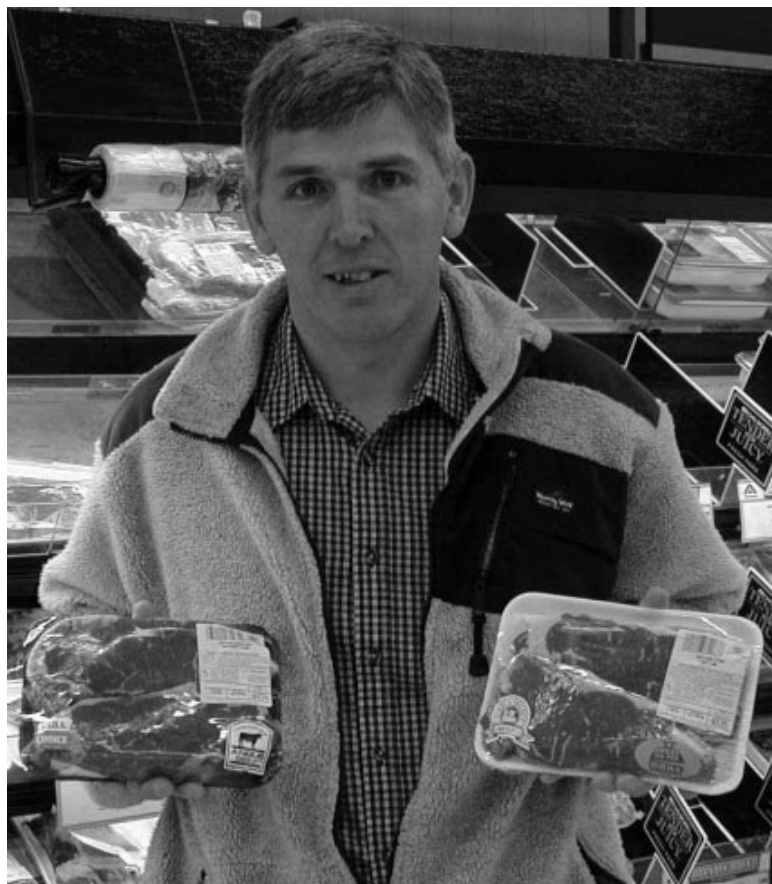
Consumers from Chicago, Illinois and San Francisco, California<sup>1</sup> were selected and screened based on a broad range of questions regarding demographics and meat eating practices. Individuals meeting the trial specifications were invited to participate in a research experiment where they would sample various New York Strip steaks. They were told they would receive \$25 (Chicago) or \$35 (San Francisco) for their participation and they would have the option to purchase steaks similar in quality to those they had sampled. Twenty-four taste panels consisting of 12 consumers each

were scheduled for a total of 144 participants in Chicago and 144 participants in San Francisco.

Once at the research facility, consumers were first paid the amount specified over the phone and were then asked to complete surveys describing their meat purchasing behavior, eating preferences, knowledge of beef and demographic characteristics. The Vickery auction process was then explained. Participants were encouraged to bid exactly what they believed the product to be worth to them. They were informed that if they submit-

ted a successful bid, they were obligated to purchase the steak they bid on at the auction market price. Three practice (nonpurchase) auctions were performed to familiarize the consumers with the auction process. Consumers were then brought into taste panel booths where they were given a warm up sample of steak to taste and evaluate.

Consumer panelists tasted four samples from two paired sets of steaks. The two pairs were high marbled versus low marbled steaks (USDA upper two-thirds Choice versus USDA Select). Each



*How do consumers choose the meat they purchase? Dillon Feuz used USDA Select and Choice steaks to study consumer preferences.*

<sup>1</sup>The Chicago market is typically characterized as a Choice beef market while the San Francisco market is characterized as a Select beef market.

**Table 1. Definitions of demographic variables and summary statistics.**

Definition	Chicago %	San Francisco %	Overall %
Gender of Respondent:			
1 = Male	17.09	21.10	19.03
2 = Female	82.91	78.90	80.97
Age of respondent:			
1 = Under 25 years	1.71	3.67	2.65
2 = 25 - 34 years	5.13	7.34	6.19
3 = 35 - 44 years	47.86	29.36	38.94
4 = 45 - 54 years	31.62	26.70	34.07
5 = 55 - 64 years	13.68	22.94	18.14
6 = Over 64 years	0.00	0.00	0.00
Ethnic background:			
1 = White/Caucasian	94.87	74.31	84.96
2 = African American	2.56	6.42	4.42
3 = Hispanic	1.71	9.17	5.31
4 = Asian	0.85	0.92	0.88
5 = Native American	0.00	0.92	0.44
6 = Other	0.00	8.26	3.98
Education level of respondent:			
1 = Elementary school	0.00	0.00	0.00
2 = Some high school	0.85	0.92	0.88
3 = High school graduate	18.80	10.09	14.60
4 = Some college	33.33	47.71	40.27
5 = Completed junior college	11.11	16.51	13.72
6 = Completed 4-year university	24.79	17.43	21.24
7 = Completed graduate school	11.11	7.34	9.29
Household income level:			
1 = Less than \$20,000	3.48	3.81	3.64
2 = \$20,000 to \$29,000	3.48	3.81	3.64
3 = \$30,000 to \$39,999	11.30	6.67	9.09
4 = \$40,000 to \$49,999	8.70	16.19	12.27
5 = \$50,000 to \$59,999	12.17	9.52	10.91
6 = \$60,000 to \$69,999	16.52	15.24	15.91
7 = \$70,000 to \$79,999	11.30	10.48	10.91
8 = \$80,000 to \$89,999	10.43	11.43	10.91
9 = \$90,000 to \$99,999	6.09	9.52	7.73
10 = Greater than \$100,000	16.52	13.33	15.00
Number of family members living in household			
1 = 1	4.27	9.17	6.64
2 = 2	13.68	19.27	16.37
3 = 3	17.09	22.94	19.91
4 = 4	31.62	32.11	38.86
5 = 5	28.21	13.76	21.24
6 = more than 5	5.13	2.75	3.98
Marital Status:			
1 = Single	7.76	16.51	12.00
2 = Divorced	6.90	11.01	8.89
3 = Separated	0.86	0.92	0.89
4 = Married	83.62	67.89	76.00
5 = Widowed	0.86	2.75	1.78
6 = Domestic partnership	0.00	0.92	0.44
Employment:			
1 = Student	0.85	2.75	1.77
2 = Part-time	36.75	24.77	30.97
3 = Full-time	34.19	45.87	36.73
4 = Not employed	34.19	26.61	30.53

pair of steaks had similar Warner-Bratzler shear force values, therefore, holding tenderness constant within the paired comparisons<sup>2</sup>. All the steaks were cooked to the same degree of doneness (70°C, a medium degree of doneness).

After consumers tasted each steak sample, they rated it on sensory traits (juiciness, tenderness, flavor and overall acceptability). Consumers were given a set of “bid sheets” where they wrote down their bid price for each steak after they had completed sensory evaluations on both steak samples in a pair. Each bid was for one pound of frozen, packaged New York strip steaks from the same loin as the steak they had tasted. After all of the bids were turned in for the pair, the fourth highest bid for each steak was announced as the market price. The participants knew that they had “won” an auction if they submitted a bid above the market price. Consumers did not actually pay for the steaks until the entire auction process was complete and they had tasted, rated, and bid on all steak samples.

## Participant Demographics

In total, 248 consumers actually participated in the study, 124 in Chicago and 124 in San Francisco. Demographic summary statistics are provided in *Table 1*. Approximately 81 percent of the consumers participating in the study were female, with slightly more male consumers participating in San Francisco. The majority of the consumers were between 35 and 54 years old and the dominant ethnic background was White/Caucasian. On average, most participants had some college education with annual household income levels around \$60,000 to \$69,000, were married and lived in households with three to four family members.

*Table 2* provides the results from the purchasing behavior and consumption preferences survey questions. Fifty-eight percent of the respondents prepare and eat meat three to six times per week with Chicago consumers eating meat more times per week than San Francisco

24 <sup>2</sup>Warner-Bratzler shear force measures the amount of force required to penetrate a cut of meat and allows a numerical value to be assigned indicating its tenderness level. It is the most accurate measurement of the variation in steak tenderness (Shackelford et. al., 1996).

participants. Beef (63 percent) and chicken (27 percent) are the meat products that participants most prefer to consume. When consuming meat at home, participants most commonly consume beef (65 percent) with chicken coming in second (32 percent). The majority of participants preferred steak (76 percent) or roast beef (16 percent). Most consumers preferred to grill or to broil their steak to a medium degree of doneness; however, Chicago consumers prefer their steak more well done than San Francisco consumers.

When surveyed about their satisfaction with the flavor, tenderness and juiciness of the beef products they consumed, 93 percent were satisfied. On average, quality was marked most commonly as being the “driver” of shopping decisions, however, both price and quality appear to be important to Chicago consumers. Forty-eight percent of the participants indicated that they typically bought USDA Choice grade steaks, 15 percent usually purchase USDA Select steaks and 33 percent did not know what quality grade they purchased. Forty-six percent indicated they stopped purchasing a beef product because they were unsatisfied with the flavor, tenderness or juiciness.

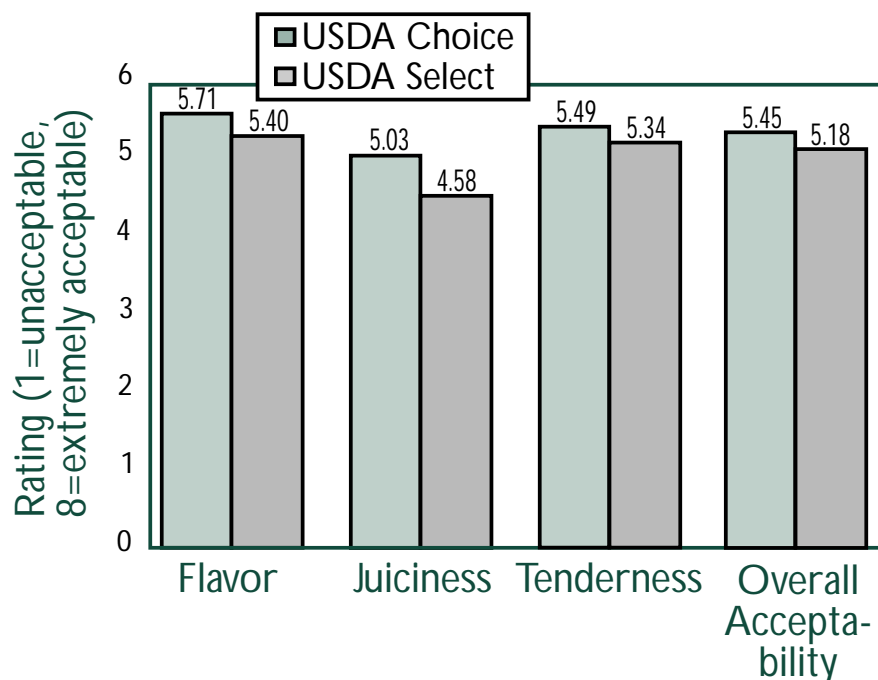
## Results

*Figure 1* shows the results of the sensory evaluations from the USDA Choice and USDA Select steak comparison for both Chicago and San Francisco. No significant differences in taste panel ratings were found between cities. On average, panelists ranked the flavor desirability, juiciness and overall acceptability of the high marbled steak significantly higher than the low marbled steak. Consumers also tended to perceive the Choice steak to be more tender than the Select steak (even though tenderness was held constant). These results suggest that consumers can detect significant differences in sensory traits between the two marbling categories.

**Table II. Definitions of meat and beef purchasing behavior variables and summary statistics.**

Definition	Chicago %	San Francisco %	Overall %
Number of times per week meat products are prepared and eaten in home.			
1 = 1-2 times	5.13	5.50	5.31
2 = 3-4 times	22.22	40.37	30.97
3 = 5-6 times	25.64	28.44	26.69
4 = 7-8 times	19.66	14.68	17.26
5 = 9-10 times	10.26	3.67	7.08
6 = more than 10	17.09	7.34	12.39
Preferred meat product for consumption:			
1 = Beef	61.61	65.09	63.30
2 = Pork	7.14	0.00	3.67
3 = Chicken	25.00	28.30	26.61
4 = Lamb	0.89	2.83	1.83
5 = Fish	5.36	1.89	3.67
6 = Duck	0.00	1.88	0.92
Meat product consumed most often at home:			
1 = Beef	65.52	64.76	65.16
2 = Pork	0.00	0.95	0.45
3 = Chicken	32.76	30.48	31.67
4 = Lamb	0.00	0.00	0.00
5 = Fish	1.72	3.81	2.71
6 = Other	0.00	0.00	0.00
Preferred type of beef to consume:			
1 = Steak	73.50	79.44	76.34
2 = Ground Beef	7.69	5.61	6.70
3 = Roast	17.95	13.08	15.63
4 = Other	0.85	1.86	1.34
Preparation method for cooking beef steaks:			
1 = Broiling	23.68	27.36	25.45
2 = Grilling	65.79	56.60	61.36
3 = Pan Broiling	3.51	3.77	3.64
4 = Pan Frying	1.75	4.72	3.18
5 = Roasting	2.63	3.77	3.18
6 = Stir-Frying	0.88	1.89	1.36
7 = Braising	0.00	0.00	0.00
8 = Cooking in Liquid	1.75	1.89	1.82
Satisfaction with the flavor, tenderness, juiciness of the beef products consumed:			
1 = Extremely satisfied	5.98	6.42	6.19
2 = Very satisfied	28.21	45.87	36.73
3 = Satisfied	58.12	42.20	50.44
4 = Unsatisfied	7.69	4.59	6.19
5 = Very unsatisfied	0.00	0.92	0.44
6 = Extremely unsatisfied	0.00	0.00	0.00
Grade of beef steaks typically purchased:			
1 = USDA Choice	46.96	48.62	47.77
2 = USDA Select	13.91	15.60	14.73
3 = Don't know	33.91	33.03	33.48
4 = USDA Prime	0.87	1.83	1.34
5 = Other (Branded Product)	4.35	0.92	2.68
Factor “driving” shopping decisions:			
1 = Price	31.25	15.00	23.58
2 = Quality	46.43	64.00	54.72
3 = Budget	10.71	8.00	9.43
4 = Health	11.61	13.00	12.26
Where beef is typically bought:			
1 = Grocery store	86.96	75.76	81.78
2 = Butcher shop	9.57	15.15	12.15
3 = Other	3.48	9.09	6.07
Stopped purchasing beef due to dissatisfaction with product's tenderness, flavor, or juiciness:			
1 = Yes	50.86	39.81	45.54
2 = No	49.14	60.19	54.46

**Figure 1. Taste panel ratings for USDA upper two-thirds choice and select beef steaks.**



**Table III. Average auction bids (\$/pound) for USDA Choice versus Select beef steaks (standard deviation in parenthesis).**

Treatment:	Chicago Mean (Std. Dev.)	San Francisco Mean (Std. Dev.)	Overall Mean (Std. Dev.)
High Marbled (USDA Upper 2/3 Choice)	\$2.40 (1.19)	\$2.76 <sup>a</sup> (1.46)	\$2.57 (1.34)
Low Marbled (USDA Select)	\$2.15 (1.01)	\$2.73 <sup>a</sup> (1.33)	\$2.43 (1.21)
Difference (Choice vs. Select)	\$0.25 <sup>b</sup>	\$0.03	\$0.14 <sup>b</sup>

N=226

<sup>a</sup>= Average bid is significantly different ( $\alpha = .05$ ) between locations.

<sup>b</sup>= Average bid is significantly different ( $\alpha = .05$ ) between treatments.

After completing the sensory evaluations, participants bid on each pair of steaks. A few participants only wanted to participate in the research trial for the cash and chose not to bid on any steaks. Participants who bid zero on all steaks were eliminated from the data set leaving 226 usable participants. On average, consumers were willing to pay slightly more for the more marbled beef steak, which they perceived to have a higher overall acceptability rating. In Chicago, these differences were valued at an additional \$.25 per pound (Table III). Although consumers in San Francisco also found the higher marbled steaks to have a more desirable flavor, greater juiciness and higher overall acceptability, they were only willing to pay \$.03 more per pound.

The results are simply average taste panel rankings and bid prices. One objective of this research was to investigate if consumers exist who prefer, and are willing to pay more for high marbled beef versus low marbled beef and vice versa. Based on overall acceptability rankings and bid differentials between pairs of steaks, consumers were identified who consistently preferred, and were willing to pay more for a particular flavor. Sixty-five consumers were consistently willing to pay significantly more (an average of \$1.30 per pound more) for the USDA Choice beef, 31 consumers were consistently willing to pay significantly more for USDA Select beef (an average of \$1.63 per pound more), and 130 participants were indifferent between USDA Choice and Select (Figure 2).

Clearly some consumers prefer higher marbled steaks to lower marbled steaks and vice versa. Each group is

#### Equation 1.

$$ABIDDIFF = f(\text{loc, gen, eth, age, edu, size, inc, eatmeat, beefeat, pref, cook, done, satisfy, drive, grade, buy})$$

$$\text{where } ABIDDIFF = ((C1 - S1) + (C2 - S2))/2$$



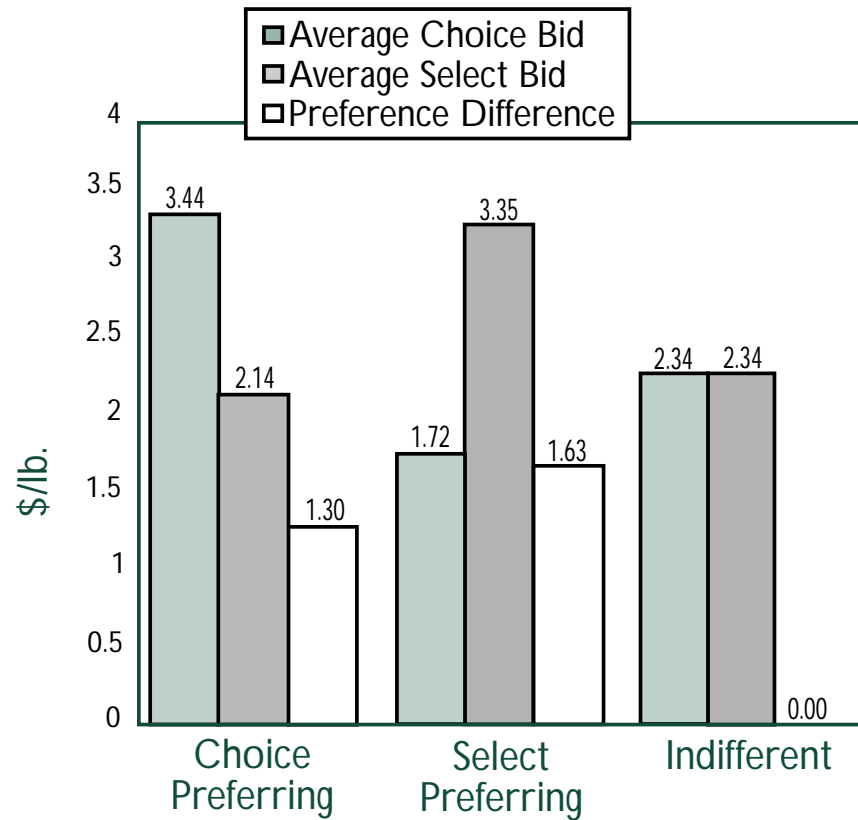
willing to pay more for their preference and those with a stronger preference generally have a larger bid differential. Can we identify consumers by their demographic traits and predict which flavor they will prefer, determine how strong their preference is, and their willingness to pay? Equation 1 was estimated using OLS regression procedures.

ABIDDIFF is the average bid difference between the USDA Choice steak and the USDA Select steak sample. C1 and C2 are the bids on the first (C1) and second (C2) USDA Choice samples, S1 and S2 are the bids on the first (S1) and second (S2) USDA Select samples. ABIDDIFF is positive/negative for consumers consistently willing to pay more for the Choice/Select steak sample or zero for consumers who were indifferent. *Loc* is either Chicago or San Francisco, *gen* is either male or female, *eth*, *age*, *edu*, and *size* are respectively, the ethnic background, age, education level, and family size of the participants.

*Eatmeat* is the number of times per week that meat is eaten in the home. *Beefeat* is equal to one if beef is consumed most often and is equal to zero otherwise, *cook* is the preferred steak cooking method, *done* is the preferred degree of doneness for steaks, *satisfy* is the consumer's satisfaction with the flavor tenderness and juiciness of beef products consumed, *drive* is the factor driving shopping decisions, *buy* is where beef is typically bought, *grade* is the USDA grade of beef typically purchased.

The results from the regression analysis are shown in Table IV. The model was not very revealing; the  $R^2$  value was 0.12 for Equation 1. Other functional forms, regression procedures, and demographic variables were considered with similar or poorer results. Only the *befeat* and *inc* variables were significant ( $\alpha = .05$ ) indicating that participants who consume beef most often will bid higher for the USDA choice

**Figure 2. Average bids for preferred beef flavor (USDA upper two-thirds Choice versus USDA Select beef steaks).**



**Table IV. Regression coefficients for USDA Choice versus USDA Select (ABDIFF) model.**

Variable	Coefficient	t statistic
Loc	-0.280	-1.381
Gen	-0.146	-0.633
Eth	0.081	0.919
Age	-0.088	-0.900
Edu	-0.010	-0.129
Size	-0.124	-1.566
Inc	0.101 <sup>a</sup>	2.654
Eatmeat	0.043	0.623
Beefeat	0.550 <sup>a</sup>	2.800
Pref	-0.001	-0.005
Cook	0.020	0.276
Done	-0.101	-1.352
Satisfy	-0.005	-0.037
Drive	-0.022	-0.204
Grade	0.036	0.473
Buy	0.031	0.287

<sup>a</sup>= coefficient is statistically significant at the 5 percent level  
n=188;  $R^2 = .12$



steak and as income increases, consumers tend to bid more for the higher marbled steak.

## Summary and Implications

These results indicate that: 1) consumers can determine a flavor difference between steaks of varying degrees of marbling when tenderness is held constant, and 2) consumers are willing to pay a significant premium for the steak that they prefer. Consumers who consistently preferred the upper two-thirds USDA Choice steak to the Select steak (29 percent of the participants) were willing to pay an average of

\$1.30 per pound more for the Choice over the Select steak. On the other hand, those who consistently preferred the Select steak over the Choice steak (14 percent of the participants) were willing to pay \$1.63 per pound more for Select.

The results of this study should interest agribusiness firms who are considering creating branded beef products. While demographic groups of consumers could not be identified, the results show there are consumers who can distinguish a flavor difference and are willing to pay a significantly higher price for their preferred flavor. Thus, it is important that consumers are properly

informed of the factors affecting the palatability of their steak. As more is learned about consumer preferences for beef and as those preferences are met with the appropriate product, it is likely that demand for beef in the U.S. can be increased.

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# Focus on teaching

## Faculty exchange program with Russia and Ukraine in its third year

In 1999 the Institute of Agriculture and Natural Resources Departments of Agricultural Economics and International Programs teamed up with the USDA to start a faculty exchange program with Russia and the Ukraine. Lynn Lutgen, Department of Agricultural Economics, and Susan Miller, International Programs, oversee the University's responsibilities in the exchange program.

Each year four visiting professors spend six months in the Department of Agricultural Economics learning new technologies and developing new courses and articles to take back to their homeland. A follow-up visit is conducted by Lutgen and Miller after the professors return home. The four professors from the first exchange are now teaching new courses and have assumed leadership roles at their respective universities.



*This year's participants in the exchange program included (left to right) Serguei Vodolazsk, Olena Lutsenko, Alexander Kovalchuk, and Marind Yermyszina.*

## Students participate in agribusiness exchange to France

For the seventh consecutive year, 15 College of Agricultural Sciences and Natural Resources students participated in the French Agribusiness Exchange program with *Etablissement National d'Enseignement Supérieur Agronomique de Dijon* in Burgundy, France. The students, led by faculty member George Pfeiffer, visited French agribusinesses, farms, wineries, and agricultural product processing facilities for 2 1/2 weeks in May. To prepare for the trip, students attended a series of seminars which covered trade policies between Europe and the U.S., European agricultural and agribusiness practices, and barriers and encouragement for international trade. Students experienced the characteristics of French agriculture that make it unique, and the characteristics that are similar to Nebraska agriculture.

## Class now available at night

The Department of Agricultural Economics offers classes at nontraditional times. In fall 2001, AECN 452-852 (Agricultural Finance) will be taught weekly on Tuesday evenings from 6:30 to 9:20. This course is available for undergraduate or graduate credit. For more information call Glenn Helmers at (402) 472-1788 or e-mail [ghelmers1@unl.edu](mailto:ghelmers1@unl.edu).

# Focus on research

## **Age of calf at weaning of spring-calving beef cows and the effects on cow and calf performance and production economics**

Over 5 years, spring-calving cows were used to evaluate effects of calf age at weaning on cow and calf performance and production economics. Three weaning ages were evaluated—early (150 days), normal (210 days) and late (270 days). If calves were sold at weaning time, the late wean system was most profitable; however, carrying calves through the feedlot favored the early-weaned system. In addition to cost differences among the systems, market timing and finishing weight were important variables that influenced the results. This research was conducted in southeast Nebraska.

*Rick. J. Rasby, **Richard T. Clark.**, et. al.*

*For more information, please e-mail Richard Clark, [rclark3@unl.edu](mailto:rclark3@unl.edu).*

## **Assessment of climate change in the Great Plains**

This research project involves a group of scientists from various disciplines examining impact and potential impacts of climate change on wheat production and the wheat production and the wheat economy of Nebraska. In the first stage of the economic analysis, wheat yield trends and production efficiency changes were analyzed for the central plains and other regions of the U.S. Wheat production efficiency in the northern, central, and southern plains was found to lag behind other wheat producing regions. The analysis clearly identified the importance of precipitation and temperature in critical stages of wheat growth. In the second stage of the project the focus will be the analysis of weather variability over the past century in relation to recent weather phenomena. Also, the impacts of potentially major weather changes on the Nebraska wheat sector will be estimated.

*Albert Weiss, Timothy J. Arkebauer, P. Stephen Baenziger, Kent M. Eskridge, **Glenn A. Helmers**, and Jerry W. Maranville*

*For more information, please e-mail Glenn Helmers, [ghelmers1@unl.edu](mailto:ghelmers1@unl.edu).*

## **Monitoring Nebraska's farm real estate market**

This ongoing research project, now in its 24th year, follows the farm real estate market trends and conditions across the state. Using a reporter panel of real estate professionals, conditions are surveyed at the beginning of each year regarding real estate values, cash rental rates, average rates of return, and general market characteristics. Results from the February 1, 2001 survey indicate agricultural land values and cash rental rates have remained relatively stable over the past year despite considerable economic uncertainty in the agricultural sector. While low crop commodity prices and higher input costs seriously cut into cropland returns, massive federal farm program payments shored up cropland values and rents over the past few years. Rangeland values and rents have moved upward in recent months, reflecting a more profitable cattle economy. Demand for land to buy as well as to cash rent remains strong, primarily driven by expanding operators.

*Bruce B. Johnson*

*For more information, please e-mail Bruce Johnson, [bjohnson2@unl.edu](mailto:bjohnson2@unl.edu).*

## **Economic impact of UNL research: grain processors' byproducts**

An ongoing project by Richard Perrin, Jim Roberts professor in the department, examines the economic impact of publicly funded research through IANR's Agricultural Research Division (ARD). While privately funded agricultural research now substantially exceeds the level done by land-grant universities and USDA, there are still vital roles for public-funded research. One of these roles is that of basic biological research for which there are no appropriable returns to entice private funding. Another role is to conduct applied research that generates technology with payoff to producers, but with little incentive for private companies to undertake.

An example of applied technology research is the ARD efforts that demonstrated the feasibility of feeding corn sweetener/ethanol industry byproducts directly to fattening cattle in wet form, rather than marketing them as dried feeds. Based in part on this research, the huge expansion of the Nebraska ethanol industry during the 1990s was based on facilities

designed primarily for wet feeding of these byproducts. Using a combination of experimental results, survey data and market prices, the economic impact study established the value of these products as cattle feed to have been about \$130 per ton of dry matter during the 1990s, compared to their alternative value as dried feed of \$93 per ton. Given the prices at which these wet feeds have been delivered to cattle feedlots, about 85 percent of this \$37 per ton benefit accrued to feeders, with the remainder going to processors.

Nebraska's ethanol plants were grinding about 11 million bushels of grain in 1992, but with the addition of five new plants, this amount grew to nearly 200 million bushels by the end of the decade, roughly 16 percent of the Nebraska corn crop. Given the above estimates of net benefits per ton of byproduct, the annual economic benefit to Nebraskans from this research effort grew from about \$1 million in 1992 to an annual average of about \$42 million during 1997-99. As it happens, this is almost exactly equal to the total public funding for the ARD. Clearly, there are other ARD research efforts that produce direct economic benefits, and many others that produce benefits that are less tangible. This particular impact study indicates that publicly-funded agricultural research continues to offer high returns to the public, given that the payoff from just a single research outcome is equivalent to the entire public investment over a period of years.

*Richard K. Perrin*

*For more information, please e-mail Richard Perrin, rperrin1@unl.edu.*

#### **Limited irrigation management strategies: yield and net return implications**

Since 1996, an irrigation management demonstration project has been underway in the Republican River Basin. The project's purpose is to demonstrate implications of alternative irrigation management strategies on water use and profitability. In certain growing season periods, such as the vegetative growth stage, irrigation usually can be reduced with little or no effect on grain yield. Irrigation water can be reduced to a greater extent on soils such as silt loams and sandy loams, which have a higher water holding capacity (WHC), compared to lower WHC soils, such as fine sands. The project illustrates that there is good potential for reducing irrigation water one or more inches per acre with little or no decrease in net revenue, especially on high WHC soils. In many counties in the Republican River Basin, high WHC soils are prevalent or even dominant.

*Joel P. Schneekloth, Nancy A. Norton, and Richard T. Clark*

*For more information, please e-mail Richard Clark, rclark3@unl.edu.*

#### **Valuing irrigation water for future use or marketing**

Irrigation in the Upper Republican Natural Resource District (URNRD) is restricted by a 14.5 inches per acre per year allocation. Unused allocations can be carried over to the next year, and recent NRD rules allow "banking" these water balances, which creates the potential for groundwater marketing in the near future. Based on survey information collected from URNRD irrigators for 1995-1998, a yield-irrigation response function was estimated for corn, and irrigation pump costs were calculated for each well in the survey. An economic model of irrigator behavior revealed that producers are using, on average, less water than needed to maximize current net returns per acre. Because of the carry-over rules, irrigators appear to place a value on saving water for potential future use or marketing. Water saved averaged 1.4 inches per acre and the cost to producers in foregone current net revenue averaged \$7.91 per acre. Values vary by soil type.

*Nancy A. Norton, Richard T. Clark, and Joel P. Schneekloth*

*For more information, please e-mail Richard Clark, rclark3@unl.edu.*

#### **Consumption effects of genetic modification**

This study develops a model of differentiated consumers to examine the consumption effects of genetic modification (GM) under alternative labeling regimes and segregation enforcement scenarios. Analytical results show that if consumers perceived GM products as being different than their traditional counterparts, genetic modification affects consumer welfare and, thus, consumption decisions. When the existence of market imperfections in one or more stages of the supply chain prevents the transmission of cost savings associated with the new technology to consumers, genetic modification results in welfare losses for consumers. The analysis shows that the relative welfare ranking of the "no labeling" and "mandatory labeling" regimes depends on: (1) the level of consumer aversion to genetic modification, (2) the size of marketing and segregation costs under mandatory labeling; (3) the share of the GM product to total production; and (4) the extent to which GM products are incorrectly labeled as non-GM products.

*Konstantinos Giannakas and Murray Fulton*

*For more information, please e-mail Konstantinos Giannakas, kgiannakas2@unl.edu.*

# Focus on outreach

## **Returning to the Farm winter dates**

*Returning to the Farm* is a program for families who want to bring a son or daughter into the farming or ranching operation. In its 13<sup>th</sup> year, *Returning to the Farm* effectively equips families with skills and knowledge that help them succeed in a multi-generational business. Families have the opportunity to assess their financial and personal resources and develop shared goals for their future. The 2001/2002 program will begin Dec. 14 and 15, 2001, and continue on Jan. 18 and 19, 2002. Both programs will be held in UNL's East Campus Union.

For more information, contact Larry Bitney ([lbitney@unl.edu](mailto:lbitney@unl.edu)), Wade Nutzman ([nutzman@alltel.net](mailto:nutzman@alltel.net)) or Deb Rood ([drood@unl.edu](mailto:drood@unl.edu)) at (800) 535-3456.

## **Market Journal begins second year**

*Market Journal*, a series of electronically delivered grain and livestock marketing and risk management conferences, began its second year in June. Designed to complement the extension marketing and risk management workshops held earlier this year, *Market Journal* provides current market analysis, weather and soil moisture reports, agricultural issues discussion and financial tips to producers, who can use the information to create their own marketing plan.

The videoconferences air at downlink sites around the state on the second Thursday of each month. These conferences also are streamed live on the Internet (and are archived) at [marketjournal.unl.edu](http://marketjournal.unl.edu). In addition, a second program, available *only* online, is presented on the fourth Thursday of each month. The series is free and does not require preregistration.

Downlink sites for 2001 are: Albion, Alliance, Aurora, Bridgeport, Broken Bow, Columbus, Concord, Falls City, Geneva, Lexington, Long Pine, Mead, Neligh, Norfolk, O'Neill, Ord, Red Cloud, Syracuse, Tekamah, West Point and York. For exact locations and times, contact the nearest NU extension office.

*Market Journal* is produced in collaboration with the Nebraska Grain and Feed Association. Financial support is provided by the Risk Management Agency, USDA and University of Nebraska Cooperative Extension.

For more information, contact Doug Jose by e-mail, [hjose1@unl.edu](mailto:hjose1@unl.edu), or phone, (402) 472-1749.

## **New hands-on service helps create marketing plans**

The *Nebraska Farm Business Association* (NFBA) launched a new service last year to help members develop a written marketing plan for each enterprise of their operation. "Strategy Management" links an NFBA staff member with a producer and together they create a marketing plan. Follow-up visits check progress and help keep the plan current.

The NFBA has provided record keeping and analysis assistance to Nebraska agricultural producers since 1975. Association members gain insights into the efficiency of their businesses by comparing data from their farms to group averages. The group averages are published annually and include whole farm as well as enterprise performance measures. The 2000 annual report contains many interesting facts, including things like the average cost per bushel of producing irrigated corn on cash rented land.

Membership is open to Nebraska farmers and ranchers who are interested in improving their business records, financial analysis and management decisions. Copies of the 2000 annual report are available to nonmembers for \$20 by contacting the association office.

For more information, contact Gary Bredensteiner by e-mail, [gbredensteiner1@unl.edu](mailto:gbredensteiner1@unl.edu), or phone, (402) 472-1399.

## **Women in Ag Conference enters 17th year**

The 17th annual Women in Agriculture: The Critical Difference brings together women from across Nebraska and surrounding states to learn about their agricultural profession, while this year playing host to women from Australia.

The Sept. 14-15 conference, sponsored by University of Nebraska Cooperative Extension, is the longest-running of its kind in the United States and provides a broad spectrum of farm/ranch management education.

Topics at this year's conference include major tax law revisions, income tax management, using new technologies such as palm pilots and cellular phones, identity theft, labor issues, contract farming, water law, estate and retirement planning, rental contracts, Quicken record-keeping, basic and advanced marketing, Initiative 300, value-adding products, livestock diseases, and marriage and family communications.

For more information, contact Deb Rood by e-mail, [drood@unl.edu](mailto:drood@unl.edu), or phone, (800) 535-3456.





*Women in Agriculture: The Critical Difference brings women together and provides them a support and information network.*

### **Planning guides for producers easier to use**

The 2001 *Nebraska Crop Budgets* publication has a new look. The set of budgets were consolidated and the budget book revised to make comparing alternative production practices by crop easier. The budget book also includes a complete cost breakdown for typical field operations to supplement the machinery costs reported in the custom rate guides.

The budget book is for producers, lenders, and others considering current production costs and evaluating production alternatives. *Nebraska Crop Budgets* (Extension Circular 872) is available at local NU extension offices. The complete set of budgets also will be available on the Web for the first time. Computer spreadsheet users will be able to download individual budgets and make modifications to better represent their situations. Space is provided to budget crop revenue including farm program payments.

*Crop and Livestock Prices for Nebraska Producers* (Extension Circular 883), also recently revised, provides a historical summary of prices received by producers for crops and livestock.

*For more information, contact Roger Selley by e-mail, [rselley1@unl.edu](mailto:rselley1@unl.edu), or phone, (402) 762-3535.*

### **2001 Corn-Soybean Expo Marketing workshops have successful second year**

For the second year, the statewide eight-workshop Corn-Soybean Expo Marketing series helped participants improve

their marketing and risk management skills by explaining price seasonality, the role of forward pricing in enhancing profits, and the role crop insurance can play in managing risk. Participants had the opportunity to market corn in a gaming environment and to compare their decisions with others.

Of this year's participants, 95 percent said they intend to forward price more grain in the future as a result of what they learned in the workshop. On average, participants expected to more than double the maximum quantity they forward priced. In addition, 30 percent said they expected to change their insurance coverage and another one-third planned to reevaluate their coverage as a result of what they learned.

The workshops were again co-sponsored by the Nebraska Soybean and Corn Marketing Boards, and were presented by Department of Agricultural Economics staff and Plattsmouth farmer, Roy Smith.

*For more information, contact Roger Selley by e-mail, [rselley1@unl.edu](mailto:rselley1@unl.edu), or phone, (402) 762-3535; or Doug Jose by e-mail, [hjose@unl.edu](mailto:hjose@unl.edu), or phone, (402) 472-1749.*

### **More agricultural and natural resource law courses available online**

For years AECN 256, Agricultural Law, a required course for undergraduate UNL agribusiness students, was taught traditionally through classroom lecture. Five years ago UNL's Division of Continuing Studies asked agricultural law specialist David Aiken to develop an online correspondence version for community college agribusiness students in Scottsbluff. AECN256x, Legal Aspects of Agriculture, was first offered via the Internet in the fall of 1998. Students taking the course online finished with slightly higher grades than those who took the course in the classroom at UNL. In spring 1999, Aiken experimented with the course by offering it to on-campus students via the Internet. He received positive student feedback and has taught it that way since. Other agricultural economics courses offered through the Division of Continuing Studies include AECN 357x, Natural Resources and Environmental Law, and AECN 457x, Water and Natural Resources Law. AECN 456x, Environmental Law, should be available by fall 2001. For information regarding the Division of Continuing Studies courses, call (402) 472-2175.

*For more information, contact David Aiken by e-mail, [daiken1@unl.edu](mailto:daiken1@unl.edu), or phone, (402) 472-1848.*

# Focus on people

## Distinguished Teaching Award

**Bruce B. Johnson**, professor, received a 2001 UNL College of Agricultural Sciences and Natural Resources Distinguished Teaching Award in recognition of his outstanding teaching ability and dedication to student learning. The award, which is one of the highest honors granted faculty members at UNL, was presented during the Honors Convocation on April 6. Johnson began his career at UNL as an assistant professor in 1975.

## Meet Professor Giannakas

**Dr. Konstantinos "Dinos" Giannakas** is the newest member of our faculty. He joined the department in August 1999 as an assistant professor of food and agribusiness marketing after receiving his Ph.D. in agricultural economics from the University of Saskatchewan. A native of Greece, Giannakas holds degrees and diplomas from the Mediterranean Agronomic Institute at Chania and Aristotle University of Thessaloniki and has been a visiting scholar at the University of California, Davis. He currently is teaching graduate courses in agricultural industrial organization. His research interests include agricultural industrial organization, regulatory economics and agricultural policy, contractual arrangements, and food marketing systems. His current research focuses on the economics of agricultural biotechnology, the economics of intellectual property rights, the efficiency of organic food product markets, and the incidence of traditional agricultural policy mechanisms under costly and imperfect enforcement.



## Swartz resigns to accept CASNR position

**Rosalee Swartz** resigned as program coordinator in the department to become the recruitment and placement coordinator in the College of Agricultural Sciences and Natural Resources (CASNR) on February 1. As program coordinator for 14 years, she coordinated the department's undergraduate and graduate teaching programs. Her work and enthusiasm were recognized in August 2000 when she received the Board of Regents KUDO Award. Her new responsibilities include serving as team leader for student recruitment and placement activities and coordinating the college's academic assessment programs.

## Department hosts international guests

The department has recently been home for two international guests. **Dr. Scott R. Steele**, lecturer in environmental and resource economics in the Department of Economics, National University of Ireland in Galway, Ireland, has been visiting the department while on sabbatical since June 2000. His visit will continue through this summer. Lic. **Lucila Bonilla** of the economics faculty of Universidad Nacional del Nordeste in Resistencia, Argentina, spent March and April in the department as a visiting scholar while participating in a training program sponsored by the Argentine government.

## Recent faculty appointments

**George H. Pfeiffer**, associate professor, accepted a half-time position as interim assistant dean of the College of Agricultural Sciences and Natural Resources, effective January 1, 2001. His new duties include responsibilities for the college's Masters of Agriculture program, curriculum coordination, student recruitment, retention, and learning assessment activities.

On April 1, **Sam M. Cordes**, professor, began a quarter-time appointment as senior associate with the IANR International Programs Division. His responsibilities include improving international programming and curricula within the Institute of Agriculture and Natural Resources.

## Recent faculty retirements

The face of the department has changed with the recent retirements of **James G. Kendrick**, **Michael S. Turner**, and **Maurice Baker**. Kendrick and Turner retired on December 31, 1999; Baker on June 30, 2000. All three continue to be involved in department activities as professors emeriti.

## Other news

**Gary D. Lynne**, professor, was named to the editorial board of the *Journal of Socio-Economics*. His term extends from April 1, 2001, through December 31, 2003.

**Diane Wasser**, project assistant, was elected secretary of the Nebraska Educational Office Professionals Association. Her term runs from June 1, 2001 to May 31, 2002. Wasser recently served as president of the University of Nebraska Office Personnel Association.

**Professor Azzeddine M. Azzam** travelled to Sweden in March to present a research paper at the Department of Economics, Swedish University of Agricultural Sciences. He spent the 1999-2000 academic year as a Fulbright Scholar and visiting professor.



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