

A COMPARISON OF THE EFFECT OF THE  
ECONOMIC RECESSION ON CERTIFIED ANGUS  
BEEF TO ALL BEEF PRODUCTS ON RESTAURANT  
MENUS

By

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## CHAPTER I

### INTRODUCTION

Annual beef consumption and sales data has been a widely studied topic since the 1970s. Per capita beef consumption peaked in 1975 at 40.14 kg and has been declining since, reaching 29.08 kg in 2008 (USDA-ERS, 2010). During this same time period, per capita poultry consumption increased from 17.55 kg in 1975 to 38.06 kg in 2008 (USDA-ERS, 2010). These data are alarming, but there is hope for a positive change. From 2008 to 2009, beef sales at retail, in total kilograms, increased by 6.9 percent (FMI and AMI, 2010), and beef remains the main source of protein in the American diet (Wells and Buzby, 2008).

Many reasons have been suggested for this decline in beef demand including higher beef prices compared to other proteins and health and nutrition concerns related to red meat consumption (Haley, 2001; Davis and Lin, 2005; Lin et al., 2006). The first reason has been under more speculation since the economic recession began in 2007. Health and nutrition concerns in relation to beef consumption have been considered since the Nutrition Labeling and Education Act was put into place in 1990. More recently, consumers have become more concerned with potential additives in meat and the way in which cattle were raised, which has resulted in a greater interest by consumers in natural and organic beef (Tolsana et al., 2005; Grunert, 2006). Another sector of the beef market that cannot be ignored when studying beef demand is the success of branded beef programs, namely Certified Angus Beef (CAB). While

beef demand overall has been declining, CAB has seen sales increase steadily over the past several years, including the time since the economic recession began in 2007 (CAB, 2007; Leopold, 2010).

The purpose of this study was to compare how availability and price of CAB product on menus have changed, compared to the availability and price of all beef items on menus, in the time before the economic recession began at the end of 2007 to the present.

## CHAPTER II

### REVIEW OF LITERATURE

#### **Demographics and Economics of Beef Demand**

The Continuing Survey of Food Intakes by Individuals (CSFII) data from 1994-1996 and 1998 show that black Americans consume the most beef per capita at 34.93 kg; on average males consume 17.24 more kilograms of beef in a year than females; and people living in the Midwest eat more beef than people in other regions of the United States (Davis and Lin, 2005; Lin et al., 2006). The survey also shows that ground beef is the most consumed beef product by Americans, especially by low-income households (Davis and Lin, 2005).

The unemployment rate in the United States at the end of 2010 was 9.6 percent, up from 4.8 percent at the beginning of the economic recession at the end of 2007 (Theodossiou and Hipple, 2011). Unemployment is highest for people who do not have a high school diploma at 15.4 percent, and lowest for college graduates at 4.9 percent (Theodossiou and Hipple, 2011). Because of the high unemployment rate, no less than 62 percent of shoppers had a significant drop in household income have altered their shopping habits and the amount of money they spend on food consumed away from home (FMI and AMI, 2010).

The Power of Meat study surveyed shoppers regarding their grocery shopping habits (FMI and AMI, 2010). This study found that consumers spend, on average, \$92.60 on groceries per week, that consumers are preparing more meals at home, and are using more money-saving



measures (FMI and AMI, 2010). Shoppers also spend time researching deals on meat before going to the grocery store. Customers are also willing to trade down to cheaper cuts of beef, and are more often buying large packages of beef when savings are significant (Progressive Grocer2010). In 2009, consumers purchased more ground beef and luncheon meats at the expense of pricier cuts such as steaks and chops (Progressive Grocer, 2010).

High-income households have greater disposable income and are not changing their meat purchasing behaviors as much as mid and low-income households (FMI and AMI, 2010). It has been shown that a higher income will increase consumption of beef, pork, poultry and fish at home and increase beef consumption away from home, and that men eat more beef compared to women, regardless of income level (Rimal, 2005; Lin et al., 2006; Wang et al., 2010). Lin et al. (2006) also found that a 10 percent increase in income above the poverty line increases the probability of beef consumption. The lower price of poultry at retail compared to beef has been attributed to the decrease in demand for beef (Haley, 2001), and this is supported by the evidence presented regarding income level and employment status and beef purchasing habits of consumers.

### **Health Concerns and Beef Demand**

While the economy has had an impact, the beef industry can attribute some of the decline in demand to health concerns that have been linked to eating beef. Even with current economic difficulties many are facing, health and well-being are still important in today's society, which is evidenced by the 70 percent of shoppers who reported they put "some" or "a lot" of effort into eating a healthy diet (FMI and AMI, 2010).

The amount of saturated fat and cholesterol consumed in the diet is a concern for many people in the United States, and beef has definitely felt the effects of this concern (Menkhaus et al., 1990; Capps and Schmitz, 1991). It has been suggested that consumption of beef will

increase serum cholesterol levels, and that people with hypercholesterolemia should not consume red meat (Hu et al., 1999). However, numerous studies have shown that lean beef in the diet does not adversely affect serum cholesterol (Denke, 1994; Hunninghake et al., 2000; Li et al., 2005). Since the negative impacts of beef on serum cholesterol levels have been more supported in popular media, consumers have been very willing to accept this information and reduce beef consumption, even with evidence to the contrary.

There is also concern for the possible risk of colorectal cancer from eating too much red meat. Studies have shown a possible link between the two, but are often limited by not accounting for genetics and family history, other lifestyle effects, or other factors (Willett et al., 1990; Giovannucci et al., 1994). Another fear for consumers is that too much red meat in the diet may lead to Type 2 diabetes mellitus (T2DM), but this possibility has been highly debated. Some studies have shown an increased risk for T2DM with a high intake of red meats (Aune et al., 2009), while other studies have found no association between red meat consumption and risk for T2DM (Micha et al., 2010).

These health concerns have led to an increase in poultry consumption, while beef consumption has dropped (Menkhaus et al., 1990; Lin et al., 2006). It has been shown that small changes in health information have had a greater impact on the decrease in beef sales and increase in poultry demand than have the relative price differences between beef and poultry (Kinnucan et al., 2001). Wang et al. (2010) found that consumers who valued taste most when purchasing food were more likely to consume beef; but for shoppers with a greater concern for nutrition, the use of food labels and the perceived quality of their diet were likely to reduce red meat consumption. This relates back to studies mentioned previously relating red meat consumption to increased cholesterol levels, and better nutrition labeling in the future could help to change shoppers' perceptions about beef in the diet.

The change in beef consumption is also likely a result of diet trends that have changed over time. In the 1980s and 1990s, increased grain intake was encouraged while decreasing consumption of meats for a healthy diet and weight loss strategy (Sabate, 2003). Then, in the last decade, it has become a very popular weight loss trend to decrease carbohydrate intake and increase intake of lean proteins (Gardner et al., 2007). The media attention focused on the benefits of a low carbohydrate diet may be related to the increase in beef demand from 1998 to 2003 (Tonsor et al., 2009).

### **Nutrition Labeling and Fresh Beef**

With the increase in health awareness and the perceived impact of red meat consumption on health, nutrition labels have become more important to consumers (Zarkin and Anderson, 1992; IFIC, 2008). Since the Nutrition Labeling and Education Act was enacted in 1990, nutrition labels have been required on most foods regulated by the Food and Drug Administration (FDA), but this legislation allowed labeling on fresh, single ingredient meats to remain voluntary.

In the almost 20 years since nutrition labels became mandatory, consumers have begun to regard them as a reliable source of information about the food they are purchasing. In fact, 80 percent of shoppers check the nutrition facts panel on food products “sometimes” or “every time” they shop (FMI and AMI, 2010). The International Food Information Council (2008) found that consumers check labels for nutrition information and also believe that nutrition labels help food manufacturers stay honest with all of the text on the food packages such as label claims for “low fat” or “gluten free” items.

Even with these concerns for their health, and faith in nutrition labels, many consumers are not willing to give up meat regularly (FMI and AMI, 2010). However, many shoppers do not believe that there is enough information on fresh meat labels, and this is likely to impact their shopping habits. Rimal (2005) conducted a national telephone survey to determine consumers’

attitudes toward meat labels and meat consumption habits. This study showed that consumers believe that nutrition labeling is very important for fresh meat products; and consumers who found the information on meat labels insufficient were more likely to consume beef less often and many of them would choose poultry over beef for this reason (Rimal, 2005).

This attitude appears to be changing, though. The 2010 Power of Meat study found that the number of shoppers who believe the amount of nutrition information provided for fresh meat is adequate has increased from 57 percent in 2009 to 61 percent of survey respondents in the 2010 study (FMI and AMI, 2010). This may be due to the fact that the number of fresh meat packages in the retail case with a nutrition label has also increased in recent years, from 24 percent in 2007 to 29 percent in 2010 (NCBA, 2010).

Starting in 2012, nutrition information will be required to be on the package label or available at the point of purchase for all fresh meats including whole muscle cuts as well as ground and chopped products with or without seasoning added; cuts lacking appropriate nutrition information will be misbranded under the Federal Meat Inspection Act (USDA-FSIS, 2010). The new regulation will provide shoppers with accurate information for meat products, and could increase demand for beef as a part of a healthy diet.

### **Natural and Organic Beef**

Natural and organic have become buzzwords in health, nutrition and eco-friendly circles in recent years. Products labeled as “natural” are not certified by the United States Department of Agriculture (USDA), but rather are regulated by the organization that owns the specific brand name of that product. The USDA only requires three things for a product to be classified as natural (1) the product must be minimally processed, (2) the product cannot contain any artificial ingredient, and (3) the product cannot contain any preservatives; there are no specific restrictions on management practices during the life of the animal (USDA-FSIS, 2011).

Organic meat claims are regulated by the USDA, which requires that each step in the production process of a live animal be a certified organic process from the last third of gestation until the product is sold at retail. This includes no antibiotics or hormone implants, no feed that is not certified organic, and no pesticides or fertilizers may be used that are not of natural ingredients (USDA-AMS, 2000).

Products in this category make up a very small sector of the beef market with only five percent of packages carrying a natural claim and less than two percent contain an organic seal (NCBA, 2010); yet consumers are very interested in meats with these labels. Many consumers believe that organic meat is healthier and provides better health effects, long-term (Menkhaus et al., 1990; FMI and AMI, 2010). This belief is due to consumers' belief that antibiotics, hormones and other food additives are unhealthy and undesirable in the diet (Verbeke, 2010).

Even with all of this consumer interest, sales of these products remain small, and the current economy may be responsible for that. The typical organic purchaser makes more than average and therefore has more money to spend on groceries (FMI and AMI, 2010). Products labeled as natural or organic are typically sold at a premium price compared to products without such labels. This market may increase in the future with the continually increasing interest in minimally processed foods.

### **Certified Angus Beef and Other Branded Beef Programs**

Branded beef programs market beef products that have specific qualities that are more likely to provide a pleasurable eating experience for consumers. Common requirements for these programs include animal breed or genetics, age verification, quality grade specifications, and even natural or "minimally processed" production practices.

In 1978, Certified Angus Beef (CAB) became the first branded beef program. This program is a registered trademark of the American Angus Association, and was created to

promote Angus cattle and to provide a uniform quality product. Many other branded beef programs have appeared in retail cases since 1978, including Laura's Lean Beef, Nolan Ryan All Natural Tender Aged Beef, Tyson's Chairman's Reserve Certified Premium Beef, and many grocery stores have developed brands for meat products on their shelves as well. The number of packages carrying a store brand has tripled since 2004 from 12 percent up to 36 percent (NCBA, 2010), but store brands tend to be more similar to generic beef in quality (Ward et al., 2008).

The success of these branded programs has been very good, and while many consumers say they have less concern for brands when shopping for beef, Feldkamp et al. (2003) found that when the same consumers were given real money to purchase steaks they bid more for a steak containing a brand they were familiar with. Feldkamp et al. (2003) also observed that though consumers indicated they did not believe that a CAB steak had a much greater chance to be more tender than a USDA Choice steak, they were willing to pay a premium of \$1.61 per kilogram for CAB steaks. Consumers also stated a belief that a generic steak has only a 50 percent chance of providing a pleasurable eating experience (Feldkamp et al., 2003). These observations show that branding beef products can improve consumer confidence in palatability.

The success of the CAB brand is also evidenced in annual data. From 2005 to 2008, demand for CAB resulted in \$367 million more in sales at wholesale than it would have if sold as a USDA Choice product (Leopold, 2010). The brand also sold 352.4 million kg of product in 2010, a 7.2 percent increase over the previous year (American Angus Association, 2010). These data are encouraging for the beef industry because these sales data include the economic recession that began in 2007, yet a premium product is still in high demand. This demand may be described with a similar explanation as the demand for natural and organic beef. Consumers of branded beef tend to have a higher education level and greater income than consumers who do not typically purchase branded beef (Tolsana et al., 2005). This marketing strategy has increased beef demand, at least in this sector of the market. Feldkamp et al. (2003) observed that branding

or labeling of fresh beef products can improve customer confidence in the quality of the final product, as evidenced by CAB. With the growing concerns for health and nutrition in the diet, and the faith consumers have in package labels, these marketing strategies could become even more important in the future in increasing beef demand.

### **Summary**

Consumer demand for beef has been on a steady decline for over 35 years. Consumers have decreased beef intake due to economic reasons and concerns for nutrition and health. Yet, consumers are unwilling to give up beef and have gained greater faith in the branded beef sector, as evidenced by the increase in demand for CAB compared to the beef market as a whole. Demand for beef may change with the implication of new labeling requirements on fresh meat packages in 2012. Consumers have great faith in package labels, and more information regarding nutrition, health and the amount of processing it has undergone may help to promote a positive view on beef in the diet. Additional research should be conducted on the possible impacts these factors may have on beef demand, specifically by the branded beef programs to incorporate into future marketing strategies for use as the economy begins to recover.

## CHAPTER III

### A COMPARISON OF THE EFFECT OF THE ECONOMIC RECESSION ON CERTIFIED ANGUS BEEF TO ALL BEEF PRODUCTS ON RESTAURANT MENUS

#### ABSTRACT

Beef remains the main source of protein in the American diet, even though per capita beef consumption has been declining since the 1970's. Of the many reasons suggested for this decline, the one of most concern recently is the economic recession that began at the end of 2007. Even through this time of recession, Certified Angus Beef (CAB) has seen an increase in total sales every year. The purpose of this study is to compare how the recession impacted the number of beef menu items, as well as its impact on CAB menu items.

A database containing menu information for the top 500 U.S. restaurant chains was used to search for beef menu items, including CAB. All restaurant types, meals, cuisines and regions of the U.S. were included in the search. Menu data were also broken down into the categories "appetizers", "entrées", "kid's meals", and "senior meals" to observe whether any section of the menu was more greatly impacted than another.

The number of all beef items, including CAB, increased until 2008 and then began to decline. The decline for all beef items was not significant, but it was for CAB in 2010 and 2011 ( $P < 0.10$ ). The menu category most impacted by the recession for all beef, as well as for CAB,



was the entrée category. The number of beef entrées declined after 2008, but have since recovered significantly ( $P < 0.10$ ). The number of CAB entrées offered declined after 2008 ( $P < 0.10$ ), and have not yet recovered that lost ground. Prices for all beef items have been increasing to their highest ( $P < 0.10$ ) point ever in 2011, but CAB prices have dropped a significant amount ( $P < 0.10$ ) since 2009, and have also not recovered. The recession has had an impact on restaurant offerings of beef, especially on CAB, but beef appears to be regaining lost ground, and CAB may not be far behind.

## INTRODUCTION

Annual beef consumption and sales data has been a widely studied topic since the 1970s. Per capita beef consumption peaked in 1975 at 40.14 kg and has been declining since, reaching 29.08 kg in 2008 (USDA-ERS, 2010). During this same time period per capita poultry consumption has increased from 17.55 kg in 1975 to 38.06 kg in 2008 (USDA-ERS, 2010). These data are alarming, but there is hope for a positive change. From 2008 to 2009, beef sales at retail, in total kilograms, increased by 6.9 percent (FMI and AMI, 2010), and beef remains the main source of protein in the American diet (Wells and Buzby, 2008).

Many reasons have been suggested for this decline in beef demand including higher beef prices compared to other proteins and health and nutrition concerns related to red meat consumption (Haley, 2001; Davis and Lin, 2005; Lin et al., 2006). The first reason has been under more speculation since the economic recession began in 2007. Health and nutrition concerns in relation to beef consumption have been considered since the Nutrition Labeling and Education Act was put into place in 1990. More recently, consumers have become more concerned with potential additives in meat and the way in which cattle were raised, which has resulted in a greater interest by consumers in natural and organic beef (Tolsana et al., 2005; Grunert, 2006). Another sector of the beef market that cannot be ignored when studying beef demand is the success of branded beef programs, namely Certified Angus Beef (CAB). While

beef demand overall has been declining, CAB has seen a steady increase in sales over the past several years, including the time since the economic recession began in 2007 (CAB, 2007; Leopold, 2010).

The purpose of this study was to compare how the availability and price of CAB product on restaurant menus have changed compared to availability and price of all beef items on menus, in the time before the economic recession began to the present.

## MATERIALS AND METHODS

### **Database Search**

This study was conducted using the Menu Monitor database (Technomic Information Services, Chicago, IL). This database contains the menu information of the top 500 restaurant chains in the United States. Information is obtained twice a year, once during the time between January to June and once between July and December. Information can be limited to the top 250 restaurants, the type of restaurant (limited service, full service, convenience store), by meal (breakfast, lunch or dinner), by cuisine, region of the United States (midwest, northeast, south, or west) or by time period (dating back to July to December 2004 through January to June 2011).

The search tags used were “beef” and “Certified Angus Beef”, and included the top 500 restaurants, limited and full service restaurants, all meals, cuisines and regions, and all data available from 2005 through the first half of 2011. Data were also broken into menu categories “appetizers”, “entrées”, “kid’s meals”, and “senior meals” to observe any changes in number or price of items in these groups. Certified Angus Beef also provided data of the annual total kilograms sold and kilograms sold to the foodservice sector, and these data were used to compare to the results of this study.

## Statistical Analysis

Data were analyzed using a GLM ANOVA model in SAS (Version 9.2, SAS Inst. Inc., Cary, NC). Least squares means were separated using the Turkey's means separation technique; data were considered significant at  $P < 0.10$ . The CAB annual kilograms data were analyzed using simple linear regression.

## RESULTS AND DISCUSSION

Least squares means for the number of beef items on menus, including CAB, and their average prices are presented in Table 1. The year 2005 had the lowest number of menu items and the lowest prices ( $P < 0.10$ ). The number of beef items on menus, including CAB, increased until the economic recession, and after 2008 these numbers fell (Figure 1). This decrease was not significant for all beef items, but the decline in the number of CAB menu items fell significantly ( $P < 0.10$ ) from 2008 to 2010, and have not yet recovered. However, all beef items on menus have recovered since the drop in 2009 to more ( $P < 0.10$ ) than ever before.

Restaurant prices of beef items have fluctuated some over the years (Figure 2), but have been increasing, and are higher in 2011 ( $P < 0.10$ ) than they were in 2008. However, CAB prices reached a high point in 2009, and have since been declining numerically, though not significantly.

Menu category data for all beef items are presented in Table 2. Only the number of beef entrées changed significantly during this time period, with a decline from 2008 to 2009 ( $P < 0.10$ ), but have since increased to a number similar to data prior to the affect of the recession. Prices of beef menu items did not change significantly during this time, and no clear pattern can be seen in these price changes (Figure 3). Even though the number of beef entrées declined slightly since 2008, they have remained in the top three leading entrée categories at full-service restaurant chains (Technomic, Inc., 2011). Beef has likely held on to a top spot as a result of

increasing incidence at limited services establishments over the past two years (Technomic, Inc., 2011).

Menu category data for CAB options are presented in Table 3. Again, the only significant difference in number of menu items was in the entrée category, with number of items in 2008 being the highest, and a decline since then, including a significant ( $P < 0.10$ ) decline in 2010 and 2011 compared to 2007 and 2008. The number of senior meals available has fluctuated, though not significantly. Appetizers serving CAB product have increased from none appearing on menus surveyed in 2005, up to 3.0 in 2011, and while this change was not significant, it did lead to a significant change in price ( $P < 0.10$ ) starting in 2009. The price of CAB entrees increased from 2006 to 2009, but has since begun to decline; while the price of kid's meals with CAB products has slowly increased over the time period surveyed (Figure 4).

Annual kilograms of CAB sold for foodservice, as well as total kilograms per year, are presented in Table 4 (CAB, 2011). These data show that the total amount of CAB sold annually has been increasing overall during this time, having a linear relationship with an  $R^2 = 0.94$ . The amount sold to foodservice did not show a strong linear relationship ( $R^2 = 0.73$ ), due to the decline in 2008 and 2009, but more pounds were sold in 2010 to the foodservice sector than every before. This supports the results of this study that CAB sales have declined, but with the increase in 2010 of pounds sold this decline may now be over.

Data from the most recent National Beef Quality Audit reveal that restaurants are placing greater importance on food safety and quality grade of beef that they purchase. Of the restaurants surveyed, 34 percent are willing to pay an average premium of 15.2 percent for guaranteed food safety on products they purchase. Forty-eight percent said they are willing to pay a premium for a guarantee of cattle genetics, typically Angus genetics, with an average premium of 11.1 percent. These concerns by restaurants are likely in response to consumer preferences. Kim and Geistfeld

(2003) found that 83 percent of consumers surveyed believed that food safety was a very important concern with food eaten away from home; they also reported that 84 percent of consumers surveyed felt that food taste was very important. This desire for Angus genetics may help CAB sales, to this sector, grow even more in the future.

Why the decline in CAB sold in restaurants, when CAB sales overall have been increasing? This is likely due to the fact that the people who were most impacted by the recession were those with a lower income. As a result, these people became more conservative about the way they are spending their money (Theodossiou and Hipple, 2011; FMI and AMI 2010; Progressive Grocer, 2010). This group of people is most likely to eat at the restaurants that are included in the “top 500” restaurant chains by Menu Monitor, and therefore these restaurants were more greatly impacted by the recession. The price of premium steaks, such as CAB, is responsible for the higher beef prices on menus, which would likely deter a person with a lower income (Technomic, Inc., 2011). People with higher earning power were not as greatly affected by the recession, and may be less likely to eat at the “top 500” major chain restaurants and sales from venues this group frequents may show different results compared to the data available here. This is supported by Byrne, et. al. (1998), who found that consumers with a higher income were more likely to dine at an upscale, fine dining restaurant. The data obtained from Menu Monitor include quick-serve restaurants, such as fast food, limited service restaurants, and full-service restaurants; however, not many high-end steak houses are included in these groups.

It appears to have taken some time for restaurants to be really impacted by the economic recession since number of items is highest in almost all categories in 2008. It must be understood that the data presented here are items appearing on menus, not the amount of items sold. Also, menus are planned for restaurants in advance, and for chain restaurants, such as those use in this study, it can take quite a bit of time to make adjustments to menu items and prices, which will delay any show of an economic impact on the restaurant menus.

There is very little information on Natural and Organic beef availability in restaurants. This is likely because the market for this beef is more of a niche-market and these products are not commonly sold in major restaurant chains. The impact of health and nutrition concerns of consumers towards beef is outside the scope of this study. More research is needed to determine if these two factors have had a great impact on consumers' decisions to consume beef at restaurants.

## CONCLUSION

The economic recession that began in 2007 did have an impact on the number of beef items available on restaurant menus, especially on CAB products. The number of beef items did fall, but has since recovered. The number of CAB items, however, declined after 2009, and have not yet returned to numbers similar to those prior to the start of the recession. The menu category impacted most by the recession was entrées. The average price of all beef items on menus have increased, while the prices for CAB products have declined.

Certified Angus Beef may be on its way to recover in the foodservice sector of the market, though. With more restaurants requesting Angus beef, and more CAB product sold to this segment in 2010, it may soon recover its market share.

**Table 1. Least squares means of the averaged yearly number of beef items and prices on menus in top 500 restaurant chains**

Year	2005	2006	2007	2008	2009	2010	2011
<b>Number of items</b>							
All beef items	1.64 <sup>c</sup>	2.13 <sup>ab</sup>	2.17 <sup>ab</sup>	2.24 <sup>ab</sup>	1.99 <sup>b</sup>	2.02 <sup>b</sup>	2.37 <sup>a</sup>
CAB items <sup>1</sup>	0.58 <sup>d</sup>	1.07 <sup>c</sup>	1.63 <sup>a</sup>	1.70 <sup>a</sup>	1.48 <sup>ab</sup>	1.14 <sup>bc</sup>	1.16 <sup>bc</sup>
<b>Average item price<sup>2</sup></b>							
All beef items	6.87 <sup>c</sup>	7.69 <sup>ab</sup>	7.53 <sup>b</sup>	7.28 <sup>bc</sup>	7.50 <sup>bc</sup>	8.17 <sup>ab</sup>	8.77 <sup>a</sup>
CAB items	4.25 <sup>c</sup>	6.41 <sup>bc</sup>	8.29 <sup>ab</sup>	8.64 <sup>ab</sup>	10.12 <sup>a</sup>	8.62 <sup>ab</sup>	7.44 <sup>ab</sup>

<sup>abcd</sup>LS Means in the same row with a different superscript are different ( $P < 0.10$ )

<sup>1</sup>Certified Angus Beef

<sup>2</sup>Average prices are presented in US dollars

**Table 2. Least squares means of the averaged yearly number and price of all beef items by category on menus in top 500 restaurant chains**

Year	2005	2006	2007	2008	2009	2010	2011
<b>Appetizers</b>							
Number of items	15.0	19.5	19.0	22.0	21.0	20.0	30.0
Average item price <sup>1</sup>	8.46	8.51	8.79	8.48	8.34	9.50	9.71
<b>Entrees</b>							
Number of items	224.5 <sup>c</sup>	283.5 <sup>ab</sup>	292.5 <sup>ab</sup>	298.5 <sup>a</sup>	263.5 <sup>b</sup>	263.5 <sup>b</sup>	309.0 <sup>a</sup>
Average item price	14.26	13.39	13.05	13.23	13.95	14.49	13.93
<b>Kid's Meals</b>							
Number of items	9.5	13.0	13.0	15.0	12.0	13.0	13.0
Average item price	5.85	5.85	5.75	5.90	6.16	6.11	6.31
<b>Senior Meals</b>							
Number of items	4.5	7.0	7.0	6.5	7.0	9.0	7.0
Average item price	7.51	7.78	8.15	8.22	7.87	7.90	7.84

<sup>1</sup>Average prices are presented in US dollars

<sup>ab</sup>LS Means in the same row with a different superscript are different ( $P < 0.10$ )



**Table 3. Least squares means of the averaged yearly number and price of CAB<sup>1</sup> items by category on menus in top 500 restaurant chains**

Year	2005	2006	2007	2008	2009	2010	2011
<b>Appetizers</b>							
Number of items	0.0	0.0	0.0	1.0	2.0	1.5	3.0
Average item price <sup>2</sup>	0.00 <sup>b</sup>	0.00 <sup>b</sup>	0.00 <sup>b</sup>	4.98 <sup>ab</sup>	10.25 <sup>a</sup>	9.79 <sup>a</sup>	8.91 <sup>a</sup>
<b>Entrees</b>							
Number of items	27.0 <sup>d</sup>	49.5 <sup>c</sup>	79.0 <sup>a</sup>	80.5 <sup>a</sup>	68.0 <sup>ab</sup>	53.5 <sup>bc</sup>	54.0 <sup>bc</sup>
Average item price	12.30	11.84	11.83	12.01	15.26	14.99	13.11
<b>Kid's Meals</b>							
Number of items	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Average item price	6.25	6.45	6.65	6.80	6.95	6.95	6.95
<b>Senior Meals</b>							
Number of items	1.5	4.0	4.0	4.0	5.0	4.0	3.0
Average item price	3.66	7.74	8.12	8.16	8.19	8.31	8.09

<sup>abcd</sup>LS Means in the same row with a different superscript are different ( $P < 0.10$ )

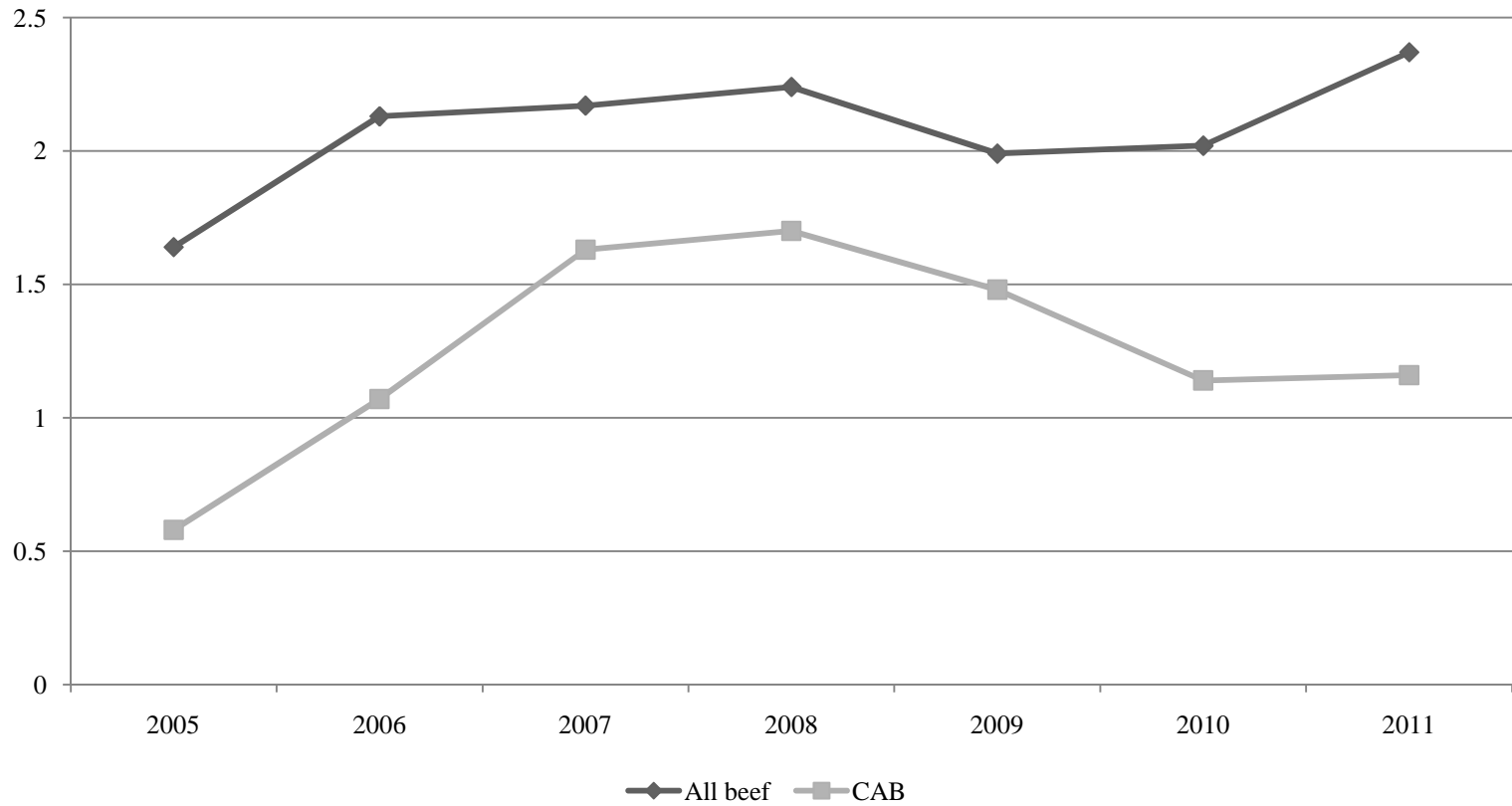
<sup>1</sup>Certified Angus Beef

<sup>2</sup>Average prices are presented in US dollars

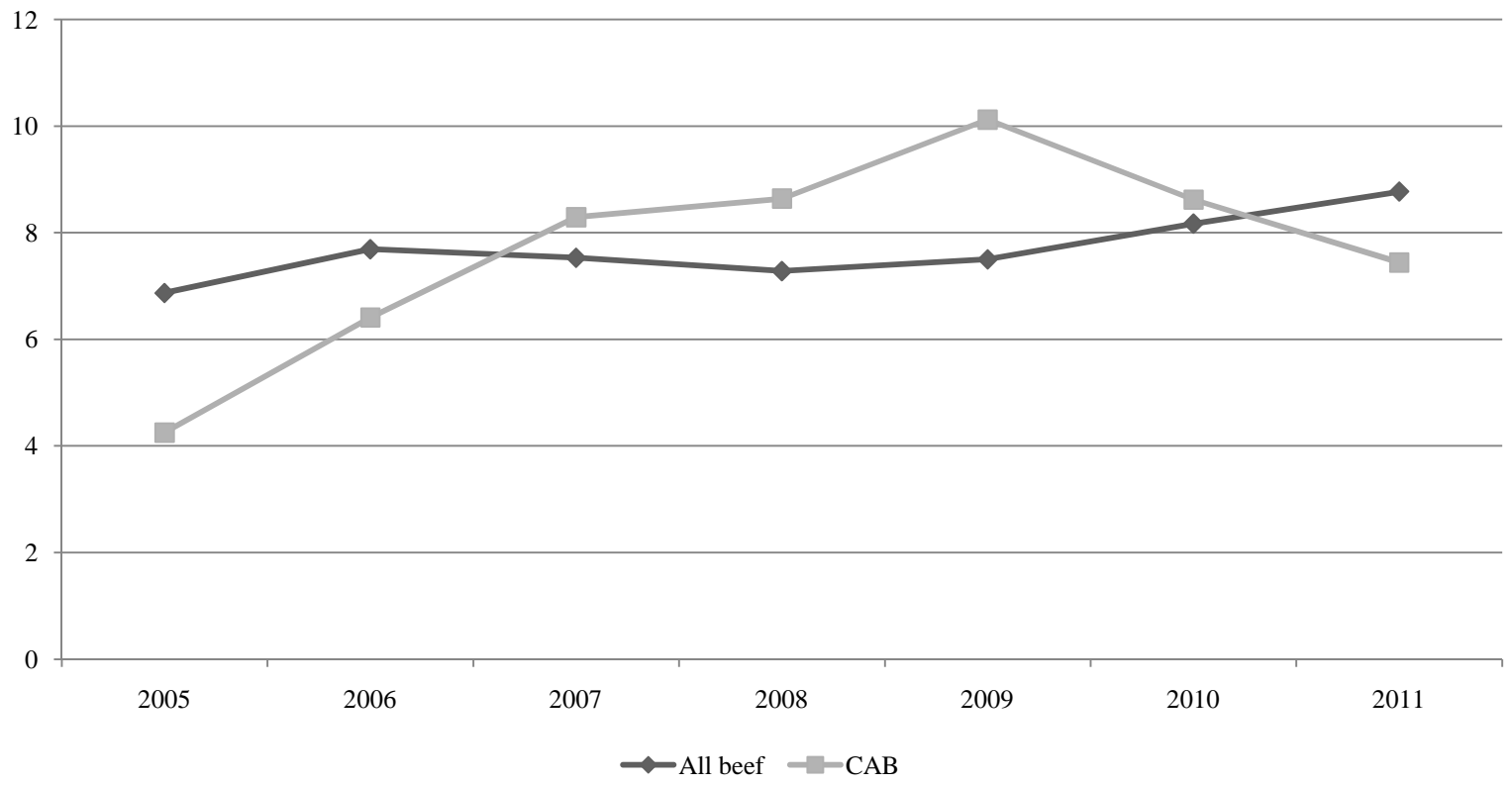
**Table 4. Kilograms of Certified Angus  
Beef sold annually**

Year	Foodservice	Total
2005	82,020,457	244,118,929
2006	86,634,534	247,221,604
2007	95,887,512	274,347,377
2008	94,322,634	289,494,395
2009	93,089,809	315,739,459
2010	105,055,115	358,918,409

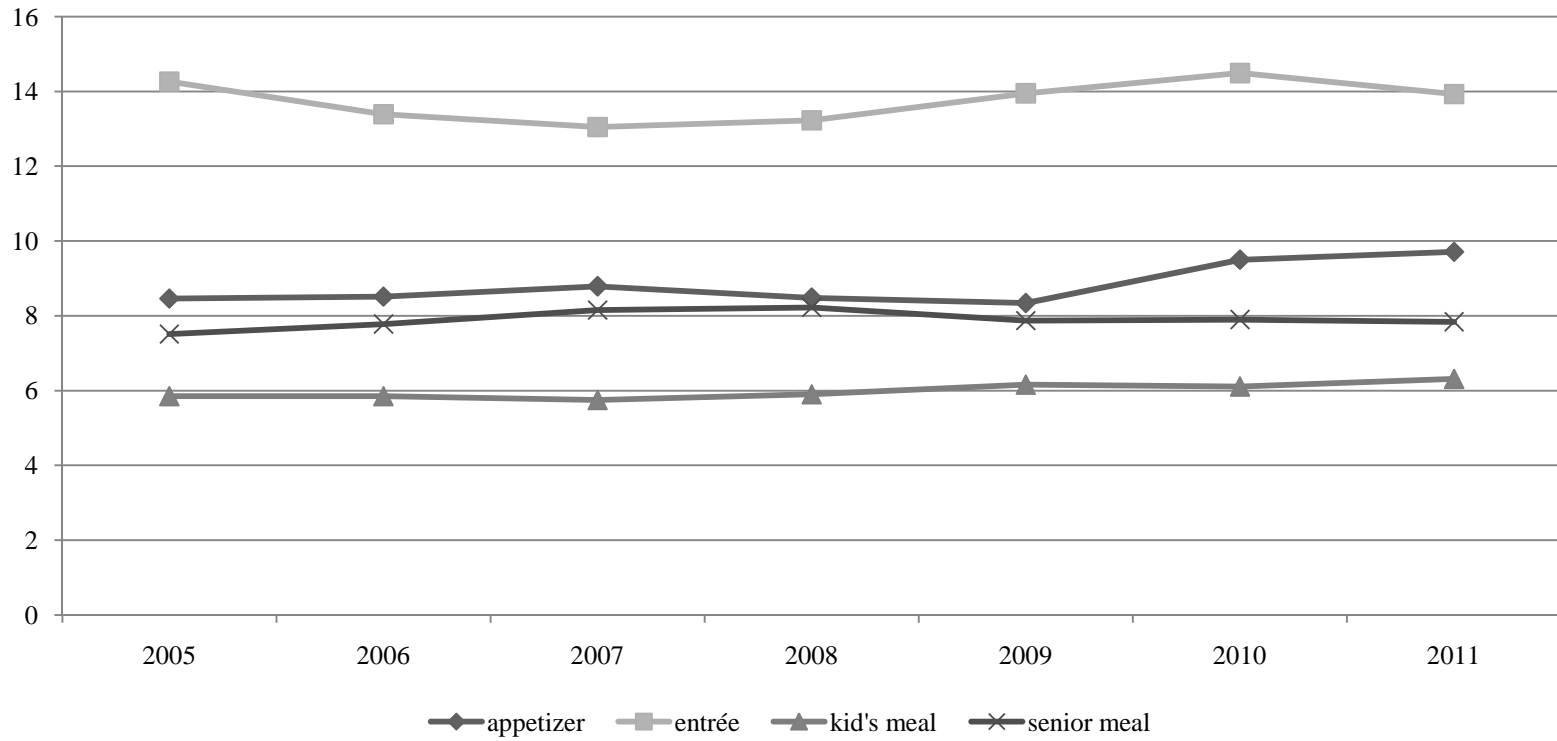
**Figure 1. Least squares means of number of beef items on menus in top 500 restaurant chains**



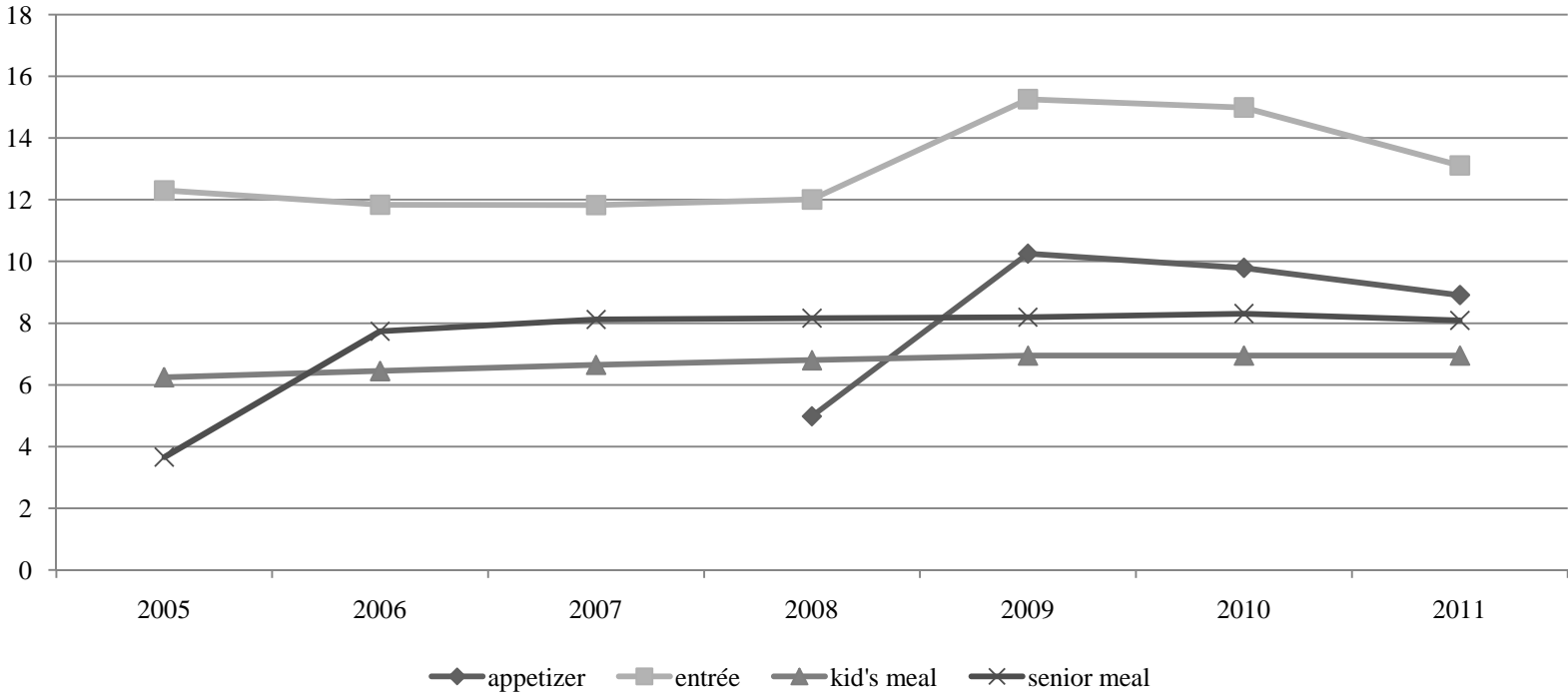
**Figure 2. Least squares means of price of beef items on menus in top 500 restaurant chains**



**Figure 3. Least squares means of the prices of beef items on menus in top 500 chain restaurants**



**Figure 4. Least squares means of the prices of Certified Angus Beef items on menus in top 500 chain restaurants**



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## APPENDICES

VITA

Mary Katherine Henderson

Candidate for the Degree of

Master of Science

Thesis: A COMPARISON OF THE EFFECT OF THE ECONOMIC RECESSION ON CERTIFIED ANGUS BEEF TO ALL BEEF PRODUCTS ON RESTAURANT MENUS

Major Field: Animal Science

Biographical: Born in Abilene, TX on April 1, 1985, the daughter of James Henderson and Beth Purser

Education: Graduated from Childress High School, Childress, TX in May 2003. Received a Bachelor of Science in Nutritional Science from Texas A&M University, College Station, TX in May 2008. Completed the requirements for the Master of Science in Animal Science at Oklahoma State University, Stillwater, Oklahoma in December 2011.

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Date of Degree: December, 2011

Institution: Oklahoma State University

Location: Stillwater, Oklahoma

Title of Study: A COMPARISON OF THE EFFECT OF THE ECONOMIC  
RECESSION ON CERTIFIED ANGUS BEEF TO ALL BEEF  
PRODUCTS ON RESTAURANT MENUS

Pages in Study: 35

Candidate for the Degree of Master of Science

Major Field: Animal Science

Scope and Method of Study: Beef remains the main source of protein in the American diet, even though per capita beef consumption has been declining since the 1970's. Of the many reasons suggested for this decline, the one of most concern recently is the economic recession that began at the end of 2007. Even through this time of recession, Certified Angus Beef (CAB) has seen an increase in total sales every year. The purpose of this study is to compare how the recession impacted the number of beef menu items, as well as its impact on CAB menu items. A database containing menu information for the top 500 restaurant chains was used to search for beef menu items, including CAB. All restaurants types, meals, cuisines and regions of the U.S. were included in the search. Menu data were also broken down into the categories "appetizers", "entrées", "kid's meals", and "senior meals" to observe whether any section of the menu was more greatly impacted than another.

Findings and Conclusions: The number of all beef items, including CAB, increased until 2008 and then began to decline. The decline for all beef items was not significant, but it was for CAB in 2010 and 2011 ( $P < 0.10$ ). The menu category most affected by the recession for all beef, as well as for CAB, was the entrée category. The number of beef entrées declined after 2008, but have since recovered significantly ( $P < 0.10$ ). The number of CAB entrées offered declined after 2008 ( $P < 0.10$ ), and have not yet recovered that lost ground. Prices for all beef items have been increasing to their highest ( $P < 0.10$ ) point ever in 2011, but CAB prices have dropped a significant amount since 2009 ( $P < 0.10$ ), and have also not recovered. The recession has had an impact on restaurant offerings of beef, especially on CAB, but beef appears to be regaining its place on menus, and CAB may not be far behind.

ADVISER'S APPROVAL: Dr. Deb VanOverbeke

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