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Backyard grower-consumer perceptions of rabbit meat consumption in rural Mississippi

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Backyard grower-consumer perceptions of rabbit meat consumption in rural Mississippi

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Submitted to the Faculty of
Mississippi State University
in Partial Fulfillment of the Requirements
for the Degree of Doctor of Philosophy
in Agricultural Science
in the College of Agriculture and Life Sciences

Mississippi State, Mississippi

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Every country in the world is affected by one or more forms of malnutrition. Malnutrition includes three conditions: undernutrition, micronutrient deficiencies or excesses, or overnutrition. Obesity is a greater contributor to death than undernutrition. Age, sex, ethnicity, socioeconomic status, and education level affect obesity. The rates of obesity vary considerably between states and regions of the country. The state of Mississippi is ranked as the poorest state in the nation and Mississippi has the highest adult obesity rate at 40.8% (Farberman & Kelley, 2020).

Rabbit meat production and consumption is a possible solution to malnutrition worldwide (Petrescu & Petrescu-Mag, 2018). Relatively easy to raise with overall economical maintenance, raising rabbits for food has many benefits. However, its consumption falls behind other protein sources like beef, pork, chicken, and turkey (Petrescu & Petrescu-Mag, 2018). Understanding backyard grower-consumers' perceptions of rabbit meat consumption could improve support and adoption of backyard rabbit programs.

The purpose of this qualitative case study was to understand the perceptions of meat rabbit growers in Mississippi backyards and relative to rabbit rearing and consumption, were growers' practices affected by external variables outside of their control. A qualitative study was

useful in both an exploratory context as well as in an explanatory context to understand not how much or how many people consume rabbit meat, but instead the how and why of raising meat rabbits in your backyard. The results of this study provide a description of underlying reasons, opinions, motivations, and potential barriers in addition to insights into the reasons some Mississippians raise meat rabbits in their backyard for consumption. Reasons for raising meat rabbits included the desire to be more self-sufficient or to at least provide some sources of food security. Participants found rabbits an attractive protein source because they are easy to raise and relatively disease free needing no vaccines or antibiotics. Weather seemed to pose the greatest barrier or challenge to growers especially the summer heat experienced in the state of Mississippi. This information can prove helpful when developing programs and recruiting those individuals to participate because of their likelihood in adopting this lifestyle.

DEDICATION

For my momma and daddy, Helen Anderson Murphree and the late James Russell Murphree, Sr.
and for my five children – Tanner, J.P., Helen Elizabeth, Tyler, and Clayton. You inspire me
beyond words.

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Thank you to my committee members Dr. Newman, Dr. Denny, Dr. Xu, and to my major advisor Dr. Swortzel.

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CHAPTER I

INTRODUCTION

Malnutrition presents a double burden of both obesity and undernutrition, even within the same populations (World Health Organization [WHO], 2020). Globally, approximately 37% of adults were overweight in 2013 (Toole, 2016). In 2016, 39% of adults aged 18 and over were overweight. From 1975 to 2016, the worldwide prevalence of obesity nearly tripled (WWHO 2020). Obesity was once considered an issue only in high-income populations that could afford to eat luxury, high-fat food items. However, this issue is on the rise in middle-and low-income areas, too (WHO, 2020).

Obesity is one of the three common forms of malnutrition. Malnutrition is a broad term that includes three conditions: undernutrition (wasting, stunting, or underweight), micronutrient deficiencies or excesses (lack or excess of important vitamins and minerals), and overnutrition (obesity or overweight). Malnutrition can be caused by not eating enough food or by eating the wrong foods (Kenya Food, 2020). Lack of access to food resources due to famine, food deserts, lack of transportation, poverty, or to a medical condition could make it difficult for someone to access food, prepare food, eat food, or to absorb the nutrients from their food (Hansen, 2016).

Excess weight and obesity are growing problems contributing to climbing rates of chronic conditions like Type II diabetes, high cholesterol, high blood pressure, and heart disease (Toole, 2016). Improving nutrition can have strong economic impacts for developed and developing countries (Toole, 2016). Stunting, one form of undernutrition, can lead to poor

cognitive development, weak educational outcomes, and reduced employment opportunities while overnutrition or obesity, another form of malnutrition, can lead to higher health care expenditures (Toole, 2016).

Obesity rates continue to rise in the United States. In 2020, 36% of adults were reported as obese and another 32.5% were said to be overweight, meaning that more than two-thirds of Americans were considered obese or overweight. Childhood obesity rates are also increasing in the United States with 19.3 % of children being considered obese. This is up from the mid-1970s when 5.5 % of young people were obese. Being overweight or obese as a young person puts them at a higher risk for being obese along with its related health risks as an adult. Also, children now exhibit earlier onset hypertension and high cholesterol, which used to be considered adult conditions (Farberman & Kelley, 2020).

Every country in the world is affected by one or more forms of malnutrition. Combating malnutrition in all its forms is one of the greatest global health challenges. In 2014, approximately 462 million adults worldwide were underweight, while 1.9 billion were either overweight or obese (WHO, 2020).

Holland (2020) reported that obesity was a greater contributor to death than undernutrition. Obesity costs Americans \$147 billion yearly and globally is responsible for 2.8 million deaths per year (Holland, 2020). Age, sex, ethnicity, socioeconomic status, and education level affect obesity. Generally, the data show that the more a person earns, the less likely they are to be obese (Farberman & Kelley, 2020). Individuals with less education were also more likely to be obese. Socioeconomic factors, such as poverty and discrimination, have contributed to higher rates of obesity among certain racial and ethnic populations (Farberman & Kelley, 2020). African American adults have the highest level of adult obesity nationally at 49.6%, driven in

large part by an adult obesity rate among African American women of 56.9%. Latino adults have an obesity rate of 44.8% while obesity rates for white adults are 42.2% and are 17.4% for Asian-American adults (Farberman & Kelley, 2020).

New concerns surrounding the impact of obesity took on new dimensions during the COVID-19 pandemic finding obesity as an underlying health condition associated with the most serious consequences of COVID infection. This new data indicated that 42% of all Americans were at an increased risk of serious, and possibly fatal, health impacts from COVID-19 due to their weight and health conditions related to obesity (Farberman & Kelley, 2020). Obesity rates vary considerably between states and regions of the country. Rural communities have higher rates of obesity than do suburban and metro areas. Food insecurity is linked to lower quality diets and tracks with higher levels of obesity in many population groups. Food insecurity is closely linked to economic conditions.

Americans spend less on food proportionate to their incomes than any other developed country in the world and on meat specifically. With a daily allowance of 5.7 ounces of meat (or protein) per day, American men on average eat 4.8 ounces of meat per day and women eat 3.1 ounces (The United States Meat Industry, 2017). About 40% of household consumer expenditures in Guatemala and the Philippines went to food in 2013, compared with just 6.7% in the U.S. Even the French and the Japanese spend about double what we spend on food (Barclay, 2015). The increased consumption of carbohydrates, sugary carbonated drinks, and sodium-filled products in Americans' diets have helped fuel the obesity epidemic (Mosher et al., 2014).

The state of Mississippi is highly agricultural – dedicated to commodity crops like soybeans and cotton rather than to specialty crops like fruits and vegetables (Hossfeld & Mendez, 2018). As a result, approximately 90% of the food that is consumed is imported

(Hossfeld & Mendez, 2018). Transporting crops great distances breaks the link between food production and consumption and directly affect the diets of Mississippians (Hossfeld & Mendez, 2018). Rather than eating carb-rich staples, Mississippians' diet has turned to vegetable oils, animal products, and sugar contributing to the obesity epidemic (Hossfeld & Mendez, 2018).

Americans are striving to eat healthier, but there is a disconnect between education and practice (Farberman & Kelley, 2020). Trends show that consumption reports suggest Americans are slowly changing their eating patterns, but there is still a considerable gap between what they are eating and what they should be eating. There are also consumption gaps between races, socioeconomic levels, genders, and educational levels. In a report sponsored by the United States Department of Agriculture, a suggestion for future research included collecting information on people's perceptions of dietary and nutrition issues and of health-related behaviors to improve approaches to translating this knowledge into action and to determine the perceived internal and external barriers that keep people from adopting and maintaining healthier food and lifestyle choices (Mosher, 2014).

Statement of the Problem

Malnutrition presents a double-edged sword with a broad spectrum ranging from undernutrition (underweight, wasting, stunting) to overnutrition (obesity). Overnutrition, caused by an energy imbalance between calories consumed and calories expended, results in obesity in children and adults, which leads to an increased risk for noncommunicable diseases such as heart disease, stroke, diabetes, osteoarthritis, and some cancers. Global obesity has nearly tripled since 1975 and in much of the world's population, obesity kills more people than those who are underweight (WHO, 2020). If the obesity epidemic is not addressed, an estimated one billion adults worldwide will be obese by 2030. In the United States, one out of every three adults is

obese. All U.S. states and territories have an obesity rate of at least 20%. In the state of Mississippi, the obesity rates top all the others in the nation with 40.8% of adults classified as obese (Center for Disease Control, 2020).

Obesity and noncommunicable diseases associated with obesity are largely preventable. A need exists for integrated programs that address dietary patterns in the areas of health, agriculture, transportation, urban planning, environment, food processing, distribution, marketing, and education (WHO, 2020). Food-based approaches have a strong potential for meeting the challenge of reducing or eliminating micronutrient malnutrition. Key challenges include making the elimination of micronutrient deficiencies more demand (community)-driven with support for appropriate food behavior change (Tontisirin et al., 2002). Supportive environments and communities are essential in shaping people's food choices. Choices need to be the easiest choice (most accessible, available, and affordable) and will therefore prevent overweight and obesity (WHO, 2020).

Rabbit meat production and consumption is a possible solution to malnutrition worldwide (Petrescu & Petrescu-Mag, 2018). Relatively easy to raise with overall economical maintenance, raising rabbits for food has many benefits. Rabbit is considered a white meat with minimal fat content, low in calories, and cholesterol-free. Rabbit consumption aids a varied and balanced diet and has less sodium than other meats and contains a higher amount of metabolism, boasting phosphorus and calcium (Jones, 2021). However, its consumption falls behind other protein sources like beef, pork, chicken, and turkey (Petrescu & Petrescu-Mag, 2018). In areas not consuming or marketing the raising and consuming of rabbit meat, it is important to start a rabbit project on a small-scale, family basis with the goal of raising rabbits is to provide a healthy animal source protein at the family level. Once the practice is established, large-scale

commercial rabbit operations may be encouraged (Lukefahr & Cheeke, 1990). Understanding backyard grower-consumers' perceptions of rabbit meat consumption could improve support and adoption of backyard rabbit programs.

General Background of the Problem

Since the 1970's, rabbit meat production in some European countries became highly specialized, but is currently facing a critical period due to structural weakness, progressive and constant reductions in consumption, and raising criticism related to welfare conditions and other ethical issues (Cullere & Zotte, 2018). China's results from a random sample of 1,084 households in eleven of its cities suggested there was a potential market for rabbit meat. The most likely consumers of rabbit meat were men and college graduates (Wang et al., 2013). According to González-Redondo and Contreras-Chacón (2012), women were more prone to express affection for animals, be more ethically motivated in their treatment, and show weaker utility orientations to them. Additionally, women were known to be more pet-oriented than men and display greater attachments to pets (González-Redondo and Contreras-Chacón, 2012).

The report noted that rabbit is high in protein and amino acids, low in fat, calories, and cholesterol – all desirable nutritional and healthy attributes which may spark future demand and increase the likelihood to consume rabbit meat. Previously, respondents had low perceptions of these characteristics which kept them from forming positive attitudes toward rabbit meat consumption (Wang et al., 2013). Results from a random sample of 1,421 households in the southern United States suggested that the most likely consumers of rabbit meat are men, non-college graduates, those with household incomes at or below \$50,000, households with children, and Louisiana residents (Beal et al., 2004).

Many parts of the world have eaten rabbit meat for centuries (Kim & Fagan, 2014). Americans, however, are reluctant to consume rabbit meat due to the rabbit's image as cute, fuzzy, innocent creatures (Kim & Fagan, 2014). Other deterrents to rabbit meat consumption include high price, lack of availability, empathy with another living creature, not being used to it, and disliking the taste (Petrescu & Petrescu-Mag, 2018). Rabbits have infiltrated nearly every part of the world and, even as prey animals, have managed to adapt and continually survive (Kim & Fagan, 2014). For many, rabbits are considered an invasive species – basically, a nuisance. Rabbits' adept reproductive capabilities, ease of keeping, and relatively low cost for feed and care make them the perfect instrument to address world hunger (Kim & Fagan, 2014).

Purpose of the Study

The purpose of this qualitative case study was to understand the perceptions of backyard rabbit meat growers in the state of Mississippi and determine if their perceptions were affected by variables outside of the growers' control. A qualitative study was useful in both an exploratory context as well as in an explanatory context to understand not how much or how many people consume rabbit meat, but instead the who and why of raising meat rabbits. The results provided a description of underlying reasons, opinions, and motivations in addition to insights into the reasons some Mississippians raise meat rabbits. This information will be helpful in targeting future participants for meat rabbit educational programs.

This study addressed the following guiding research questions:

1. What were the perceptions of backyard rabbit growers in Mississippi? More specifically, the researcher wanted to understand the influences affecting growers' decision to raise rabbits and to utilize them as a protein source.

2. How were growers' practices, relative to rabbit rearing and consumption, affected by external variables outside of the growers' control?

Significance of the Study

Overweight and obesity rates are on the rise globally. States and territories within the United States are fueling this epidemic. The state of Mississippi leads the nation in obesity (Center for Disease Control, 2020). A need exists for integrated programs that address micronutrient deficiencies and overnutrition in local communities in the state of Mississippi. Food-based approaches have a strong potential for meeting the challenge of reducing or eliminating micronutrient malnutrition. Key challenges include making the elimination of micronutrient deficiencies more demand- (community) driven with support for appropriate food behavior change (Tontisirin, et al., 2002). Rabbit consumption aids a varied and balanced diet, but its consumption falls behind other protein sources like beef, pork, and chicken (Petrescu & Petrescu-Mag, 2018). Understanding perceptions of backyard rabbit meat growers could improve support and adoption of local backyard rabbit programs creating a sustainable, healthy protein source for those who might not otherwise have one available.

Assumptions

Assumptions for this qualitative study include the researcher working closely with participants to earn trust and to minimize the distance between herself and the participants. The researcher explicitly recognizes and acknowledges the value-laden nature of this research. This research is based on inductive forms of logic and is context-bound. Multiple realities exist in any study and include the researcher's, the participants', and anyone reading or interpreting the results of the study. Multiple perspectives which include the participants' voices are included in

the study. Categories of interest may emerge from informants (internal) or be used to frame the understanding (external). Uncovering patterns or theories that help understand perceptions of interest is the goal. Determining accuracy involves verifying the information with participants and/or triangulating among different sources of information.

Definitions of Terms

The following terms were used throughout this study:

Animal Source Foods

Foods from the meat of animals that improve dietary quality, micronutrient status, growth, and cognitive function (Neumann et al., 2003).

Body Mass Index (BMI)

BMI is a measure of body fat based on an individual's weight in relation to his or her height and age. To calculate BMI, multiply your weight in pounds by 704.5 then divide the result by your height in inches the divide that result by your height in inches a second time (Torrance Memorial Physician Network, 2016).

Consumption

The act of eating or drinking something (Merriam Webster Dictionary, 2021).

Cuniculture (kew/nec/culture)

The agricultural practice of breeding and raising rabbits for meat processing and consumption (How do you say that word?, 2021).

Dietary Fats

Dietary fats are a type of nutrient that you get from your diet. It is essential to eat some fats, though it is also harmful to eat too much. All fats are made up of saturated and unsaturated fatty acids. Saturated fats raise your LDL (bad) cholesterol level. High LDL cholesterol puts you

at risk for heart attack, stroke, and other major health problems. You should avoid or limit foods that are high in saturated fats. Eating unsaturated fats instead of saturated fats can help lower your LDL cholesterol (National Institutes of Health, 2021).

Food Desert

A food desert is an area that has limited access to affordable and nutritious food. This designation considers food type and quality available to the population in addition to the accessibility of food based on proximity of food stores. A food desert in an urban or suburban area means at least 500 people or 33% of the population live more than one mile from a supermarket whereas 500 people or 33% of the population living in rural areas must live ten miles from a supermarket (Caporuscio, 2020).

Food Oasis

A food oasis differs from a food desert. It is an area with higher access to supermarkets or vegetable shops with fresh foods (Zheng, 2019).

Food Swamps

Food swamps also differ from food deserts and are environments saturated with unhealthy foods because of the large numbers of corner stores and fast-food outlets in them. In the United States, food swamps are defined as areas with 4 or more corner stores within 0.25 miles of home or where the ratio of unhealthy to healthy food establishments exceeds 3.89. Living in a food swamp has been associated with unhealthy dietary behaviors and obesity among adults and young adolescents. Consequently, some US municipalities have adopted zoning or permitting laws to improve the food environment and reduce disparities in obesity prevalence (Chew, 2020).

Functional Food

The Functional Food Center (FFC) defines “functional food” as natural or processed foods that contains known or unknown biologically active compounds, which, in defined, effective non-toxic amounts, provide a clinically proven and documented health benefit for the prevention, management, or treatment of chronic disease. This definition is unique because of its acknowledgement of “bioactive compounds”; or biochemical molecules that improve health through physiological mechanisms. Also, this definition notes that bioactive compounds must be taken in non-toxic amounts because bioactive compounds have upper limits before they become dangerous (Martirosyan & Sigh, n.d.).

Hidden Hunger

Hidden hunger is a lack of vitamins and minerals and occurs when the quality of food people eat does not meet their nutrient requirements, so the food is deficient in micronutrients such as the vitamins and minerals that they need for their growth and development (WHO, 2014).

Kwashiorkor

Kwashiorkor is a form of severe protein malnutrition caused by sufficient calorie intake but insufficient protein intake. Individuals with diets of mainly carbohydrates are at risk. It is rare in a developed country and is usually found in children around age 5. It is characterized by edema or swelling (Benjamin & Lappin, 2020).

Malnutrition

Refers to deficiencies, excesses, or imbalances in a person’s intake of energy and/or nutrients.

The term addresses three broad groups of conditions:

- Undernutrition – this term encompasses wasting (low weight-for height), stunting (low height-for-age) and underweight (low weight-for-age)

- Micronutrient-related malnutrition – a term representative of micronutrient deficiencies (a lack of important vitamins and minerals) or micronutrient excess
- Overweight, obesity and diet-related noncommunicable diseases including heart disease, stroke, diabetes, and some cancers (WHO, 2020).

Marasmus

Marasmus is protein-calorie undernutrition. It differs from kwashiorkor because there is no edema. It usually occurs in children less than one year of age. Starvation is a form of marasmus (Phillips, 2016).

Meat Rabbit

Rabbits raised for meat production. The primary qualities sought in good meat-rabbit breeding stock are growth rate and size at slaughter.

Micronutrient-related nutrition

The lack of consumption of essential nutrients like iron, iodine, and vitamin A

Noncommunicable diseases

A noncommunicable disease is a noninfectious health condition that cannot be spread from person to person. It also lasts for a long period of time. This is also known as a chronic disease.

A combination of genetic, physiological, lifestyle, and environmental factors can cause these diseases (Healthline, 2021).

Obese

Grossly fat or overweight. A person with a BMI over 30 is considered obese (Torrance Memorial Physician Network, 2016).

Overnutrition

Characterized by consuming excessive nutrients and energy intakes which can result in being overweight or obese (Undernutrition, Overnutrition, and Malnutrition, 2020).

Overweight

A person with a BMI of 25-29.9 is considered overweight (Torrance Memorial Physician Network, 2016).

Protein-energy malnutrition

There are two severe forms of malnutrition: marasmus and kwashiorkor. Marasmus is a lack of protein and calories. Kwashiorkor is a lack of just protein (WHO, 2022).

Rural Mississippi

According to Rule 1.3.1, The Mississippi State Department of Health (2020) defines a rural area as: 1) a Mississippi county that has a population less than 50,000 individuals; 2) an area that is less than 500 individuals per square mile; or 3) a municipality of less than 15,000 individuals. (How do you say that word?, 2021).

Stunted

Stunting is the impaired growth and development that children experience from poor nutrition, repeated infection, and inadequate psychosocial stimulation (World Health Organization, 2015).

Undernutrition or undernourishment

Not consuming enough nutrients (calories, protein, carbohydrates, fat, vitamins, or minerals) and energy (Undernutrition, Overnutrition, and Malnutrition, 2020).

Underweight

Underweight is weighing what is less than normal. An individual with a BMI below 18.5 is considered underweight (Torrance Memorial Physician Network, 2016).

Wasting

Wasting is a reduction or loss of body weight in relation to height (World Health Organization, 2021).

CHAPTER II

LITERAURE REVIEW

Introduction

Malnutrition refers to deficiencies, excesses, or imbalances in a person's intake of energy and/or nutrients (Malnutrition, 2020). The term malnutrition acts as an umbrella to cover three main categories of nutritional conditions: undernutrition, micronutrient-related malnutrition, and overweight or obesity and diet-related noncommunicable diseases (Malnutrition, 2020). Often, hunger and poverty are seen together in the same populations. Obesity continues to rise not only in developed countries, but in developing countries as well. Barriers to a healthy diet pose challenges. Raising backyard rabbits for one's personal consumption is one possible solution to this crisis.

Malnutrition

In 2018, there were 1.9 billion adults overweight or obese globally while 821 million were underweight (The State of Food Security, 2019). Forty-seven million children under the age of five were wasted, 14.3 million were severely wasted, 144 million were stunted, and 38.3 million were overweight or obese (Malnutrition, 2020). Deaths of 47 million children younger than age five were linked to undernutrition (Malnutrition, 2020). These deaths usually occurred in low and middle-income countries. In these same countries, childhood overweight and obesity rates were rising (Malnutrition, 2020). Overweight and obesity were linked to more deaths worldwide than underweight (Obesity and Overweight, 2020). Malnutrition is a global burden

with serious and lasting developmental, economic, social, and medical impacts for communities and for countries (Malnutrition, 2020).

Undernutrition

Undernutrition includes four broad categories: wasting or kwashiorkor, stunting or marasmus, underweight, and deficiencies in vitamins and minerals (Malnutrition, 2020).

Wasting, or kwashiorkor, is having a low weight-for-height while stunting, or kwashiorkor, is low height-for-age and underweight is low weight-for-age (Malnutrition, 2020). Both are forms of protein-energy malnutrition (Essentials of International Health, 2011).

Wasting and stunting often occur together and are associated with micronutrient deficiency (Duggan, Watkins, & Walker, 2008). Wasting usually indicates recent and severe weight loss due to someone not having enough food (a lack of protein and calories) to eat or it could result from someone having an infectious disease like diarrhea, which has caused them to lose weight (Malnutrition, 2020). Anorexia could also be a cause of wasting (Katsilambros, 2011). Moderate and severe wasting has an increased risk of death for the individual although treatment is possible (Malnutrition, 2020). Stunting (a lack of just protein) results from chronic or recurrent undernutrition and is generally associated with poor socioeconomic conditions, poor maternal health and nutrition, frequent illness, and/or inappropriate infant and young child feeding and care in early life (Malnutrition, 2020). Stunting prevents children from reaching their potential physically as well as cognitively (Malnutrition, 2020). Children who are underweight (low weight-for-age) could be stunted, wasted, or both (Malnutrition, 2020).

The term “hunger” describes a feeling of discomfort from not eating. Hunger has been used to describe undernutrition especially when referring to food insecurity (Black et al., 2008). Overweight and obesity were not considered a form of malnutrition when defined by Gomez’s

classification in 1956. His classification of nutritional status is well-known and widely used, but has been criticized for being arbitrary with the omission of overweight and obese has been viewed as a drawback (Gueri, Gurney, & Jutsum, 1980)

Micronutrient-Related Malnutrition

Micronutrients refer to the vitamins and minerals vital to healthy development, disease prevention, and well-being (Micronutrient Facts, 2020). Although required in small amounts, micronutrients are not produced in the body and must be derived from one's diet (Micronutrient Facts, 2020). Micronutrient deficiencies can have devastating consequences (Micronutrient Facts, 2020). At least half of the children in the world younger than five years of age suffer from vitamin and mineral deficiencies (Micronutrient Facts, 2020).

Micronutrients encompass vitamins and minerals. Inadequate nutrient intake is referred to as micronutrient-related malnutrition (Malnutrition, 2020). Very low dietary intake of vitamins or nutritionally essential minerals can result in deficiency disease known as micronutrient deficiency (Drake, 2017). Micronutrients are needed for the body to produce enzymes, hormones, and other substances essential for proper growth and development (Malnutrition, 2020). Iodine, vitamin A, and iron are the most important micronutrients in global public health terms and their deficiency represents a major threat to the health and development of populations worldwide (Malnutrition, 2020). This is particularly true for children and pregnant women in low-income countries (Malnutrition, 2020).

Other micronutrient deficiencies prevalent in the developing world include zinc and folate (Drake, 2017). These deficiencies, combined with iodine, vitamin A, and iron, affect an estimated two billion people worldwide (Drake, 2017). They are a major contributor to infections and are associated with severe illness and even death (Drake, 2017). Though micronutrient

deficiencies primarily affect the developing world, they are rare but not absent in populations living in industrialized nations (Drake, 2017).

Overweight, Obesity, and Diet-related Noncommunicable Diseases

Overweight and obesity result from a person being too heavy for his/her height (Center for Disease Control and Prevention, 2021). This abnormal or excessive fat accumulation can impair health (Malnutrition, 2020). Body mass index (BMI), an index of weight-for-height, is commonly used to classify overweight or obese individuals (Center for Disease Control and Prevention, 2021). BMI is calculated by weight in kilograms divided by the square of height in meters (Center for Disease Control and Prevention, 2021).

Overweight in adults is equal to a BMI of greater than or equal to 25, whereas obesity is greater than or equal to 30 (Center for Disease Control and Prevention, 2021). Overweight and obesity result from an imbalance in energy consumed (too much) and energy expended (too little) (Malnutrition, 2020). Globally, people are consuming energy-dense (high in sugars and fats) foods and drinks and engaging in less physical activity (Malnutrition, 2020). Unhealthy diets and poor nutrition are among the top risk factors globally for diet-related noncommunicable diseases (NCDs) (Malnutrition, 2020). NCDs include cardiovascular diseases such as heart attacks and stroke and are often linked with high blood pressure, certain cancers, chronic lung disease, and diabetes (Malnutrition, 2020). Collectively these NCDs are responsible for almost 70% of all deaths worldwide with the largest percent occurring in low and middle-income countries (Malnutrition, 2020).

Who is at Risk for Malnutrition Globally?

Every country in the world is affected by one or more forms of malnutrition with women, infants, children, and adolescents being particularly at risk (Malnutrition, 2020). Combating malnutrition in all its forms is one of the greatest global health challenges (Malnutrition, 2020). Poverty amplifies the risks of and from malnutrition. Poor people are more likely to experience different forms of malnutrition (Malnutrition, 2020). Optimizing nutrition early in life – including the first 1,000 days from conception to a child’s second birthday – ensures the best start in life with long-term benefits (Malnutrition, 2020). Malnutrition increases health care costs, reduces productivity, and slows economic growth (Malnutrition, 2020). These can perpetuate a cycle of poverty and ill-health (Malnutrition, 2020).

Malnutrition in the United States

Malnutrition is not just a developing country problem, but because of its wide spectrum, is also found across the globe. Through undernutrition programs in the United States like the Supplemental Nutrition Assistance Program (SNAP) and the National School Lunch Program (NSLP), most Americans are consuming enough calories daily. However, Americans – and specifically those that live in Mississippi – are facing issues with nutrient insecurity which is fueling the obesity epidemic (Pesce, 2019). Obesity caused by overnutrition is responsible for more deaths than undernutrition. Intervention focuses on individual eating behaviors (Delormier et al., 2009). Choosing lean meats like rabbit is one possible solution but its consumption falls behind beef, pork, and chicken (United States Department of Agriculture, 2020).

Undernutrition in the United States

In the United States, many federal programs exist to feed the hungry with the most popular programs including SNAP (commonly known as food stamps), NSLP, and the Special Supplemental Nutrition Food Program for Women, Infants, and Children (WIC). Other food assistance programs like food pantries, community gardens, and mobile markets are available at the state and local level (Talk Poverty, 2018). These community programs help low-income residents with food accessibility (Currie, 2003). Research has shown no relationship between an individual's acceptance of these programs and food security (Currie, 2003). Despite these provisions, barriers exist and prevent access to and consumption of healthy foods (Innis, 2014).

The United States Department of Agriculture (USDA) reported 12.3 % of American households remain food insecure, meaning that households have difficulty at some time during the year providing enough food for all their members (Feeding America, 2017). This reported percentage means that 1 in 8 households in the U.S. experienced food insecurity (Feeding America, 2017). These numbers have improved since the peak of food insecurity in 2011 following the Great Recession but have not reached the pre-recession lows (Feeding America, 2017).

Micronutrient-Related Malnutrition in the U.S.

Energy-rich, nutrient-poor foods comprise an estimated 27% of daily caloric intake in the U.S. (Drake, 2017). Alcoholic beverages add another 4% (Drake, 2017). Many Americans exceed energy (caloric) needs but do not meet the micronutrient requirements (Drake, 2017). An analysis of U.S. national survey data (National Health and Nutrition Examination Survey 2003-2006) found that children and adults who consume high amounts of added sugars (>25% of energy intake which is the upper limit recommended by the National Academy of Medicine) had

lower dietary intakes of micronutrients like vitamins A, C, and E as well as magnesium (Drake, 2017). An estimated 13% of the U.S. population have added sugar intakes greater than the cutoff level for added sugars and may be at risk for micronutrient inadequacies (Drake, 2017).

Micronutrient inadequacies, in contrast to micronutrient deficiencies, are more common in developing countries and may not cause overt symptoms, but may instead elicit symptoms of general fatigue, reduced ability to fight infections, impaired cognitive function like attention, focus, memory, and mood (Drake, 2017). Micronutrient inadequacies could impact long-term health and increase the risk for chronic diseases like cancer, cardiovascular disease, type 2 diabetes mellitus, osteoporosis, and age-related eye disease (Drake, 2017). The 2015-2020 Dietary Guidelines for Americans highlighted the nutrients under consumed in the U.S. (Drake, 2017). The “shortfall nutrients” labeled as nutrients of public health concern included Vitamin D, calcium, potassium, dietary fiber, and iron. Related health concerns were osteoporosis, hypertension, cardiovascular disease, poor colonic healthy, and anemia (Drake, 2017). Others included vitamins A, C, and E; choline and magnesium (Drake, 2017). In contrast, more than 97% of the U.S. population had excessive intakes of sodium (Drake, 2017).

Obesity and Diet-related Noncommunicable Diseases in the U.S.

According to the Centers for Disease Control and Prevention (CDC), obesity in the U.S is a common, serious, and costly disease with more than seven in 10 adults aged 20 and up being either overweight or obese (Adult Obesity Fact, 2020). From 1999-2000 through 2017-2018, the prevalence of obesity increased from 30.5% to 42.5%, and the prevalence of severe obesity increased from 4.7% to 9.2% (Adult Obesity Fact, 2020). The estimated annual medical cost of obesity in the U.S. in 2008 was \$147 billion (Adult Obesity Fact, 2020). This was \$1,429 higher than those of normal weight (Adult Obesity Fact, 2020).

Who is Most at Risk in the United States?

Non-Hispanic blacks had the highest age-adjusted prevalence of obesity (49.6%) followed by Hispanics (44.8%), non-Hispanic whites (42.2%), and non-Hispanic Asians (17.4%) (Adult Obesity Facts, 2020). Among young people aged 20-39 years, the prevalence of obesity was 40% (Adult Obesity Facts, 2020). For those middle-aged adults aged 40 to 59 years, obesity prevalence was 44.8% and 42.8% among adults aged 60 years and older (Adult Obesity Facts, 2020). The association relating obesity and income, or educational level is complex and differs by sex and race/ethnicity (Adult Obesity Facts, 2020). Overall, men and women with college degrees had lower obesity prevalence compared with those having less education (Adult Obesity Facts, 2020). Among men, obesity prevalence was lower in the lowest and highest income groups compared with the middle-income group (Adult Obesity Facts, 2020). For women, obesity prevalence was lower in the highest income group than in the middle- and lowest-income groups (Adult Obesity Facts, 2020).

The Southern United States

Southern states struggle the most with people being overweight or being obese with Mississippi being rated the fattest state overall (Pesce, 2019). This was contributed to the highest prevalence of children and adults who are overweight and obese (Pesce, 2019). The Center for Disease Control (CDC) noted in a report on the most obese states in the country that Mississippi had the lowest life expectancy and the highest rate of people who eat less than one piece of fruit a day, as well as the second lowest level of people who reported getting no exercise (Pesce, 2019). West Virginia ranked worst in terms of health consequences like Type 2 diabetes, high cholesterol, and heart disease (Pesce, 2019). Kentucky, Tennessee, and Alabama were listed next to complete the list of the top five fattest states (Pesce, 2019). These states charted the

highest rates of sugar-sweetened beverage consumption (soda and fruit drinks) with the least number of fruits and vegetables consumed (Pesce, 2019). In contrast, Utah was ranked least overweight or obese, followed by Colorado, Massachusetts, Connecticut, and California who had high ratings for fitness and eating more well-balanced diets (Pesce, 2019).

Overall, adherence to the U.S. Dietary Guidelines is low because most Americans do not follow a healthy eating pattern (Drake, 2017). Combined with physical inactivity, eating an energy-rich, nutrient-poor diet predisposes individuals to many chronic diseases (Drake, 2017). Approximately one-half of American adults have at least one preventable chronic disease (Drake, 2017). Decades of public health messages to eat a balanced diet have not resulted in behavior change (Drake, 2017).

Barriers to Healthy Food Choices in the United States

Nutrient insecurity persists despite safety net programs (Talk Poverty, 2015). Barriers to eligibility for these programs – like transportation and proper documentation verifying citizenship, medical expenses, shelter expenses, child support payments, etc. – have an impact on Mississippians receiving support (Talk Poverty, 2015). Food environment including store/restaurant proximity, food prices, food and nutrition assistance programs, and community characteristics like unemployment, low levels of education, habit, and rates of chronic disease related to nutrition in addition to poverty also act as barriers to healthy food choices (United States Department of Agriculture [USDA], 2018).

Due to more women working outside the home, a desire for convenience foods from fast food restaurants or prepared meals that require less food preparation in the kitchen are contributing factors as well (Hossfeld & Mendez, 2018). Other barriers to healthy eating mentioned in a study by Gray et al., (2015) included neighborhood environment, media, time,

and taste preferences, and even a families' use of food to show affection. According to Gray, et al., (2015), school lunches are even at fault due to the inclusion of many fried and fatty foods or the offering of purchased snacks as an alternative to a healthy school lunch (Gray et al., 2015).

To subsidize federal programs, states and communities have an array of options to lend support including food pantries, mobile markets, and farmers' markets but these but these initiatives are faced with barriers, too (Bengtson et al., 2016). Theoretically beneficial to an entire community, farmers' markets, like the one started in West Tallahatchie County in Mississippi, were developed by a group of white women, and thus perceived as intended for the white population and largely inaccessible to the African American population there due to a level of discomfort based on cultural differences (Bengtson et al., 2016).

Food Deserts and Food Swamps

Food deserts have been credited in the past as a major barrier to accessing healthy foods in Mississippi especially where food assistance is most needed (Innis, 2014). Food deserts, as defined by the USDA, exist where the poverty rate is greater than 20% and more than 33% of the population lives over a mile from the nearest supermarket (Innis, 2014). Food assistance programs are often hard to reach in food desert areas (Innis, 2014). In the Jackson, Mississippi area, one in three households fall into a food assistance gap created by public policy (Innis, 2014). Other states have eliminated the barriers associated with WIC reducing food insecurity and strengthening the local economy (Innis, 2014). If Mississippi would increase the enrollment threshold from 130% to 185% of the poverty line, eliminate the in-person interview requirement, and move WIC from state-run distribution centers to the EBT systems already in place, they could accomplish the same (Innis, 2014).

People living in food deserts are more reliant on food retailers or fast-food restaurants offering a more affordable but limited variety of foods. The lack of access to healthful foods and easy access to fast foods may be linked to poor diets that are high in sugar, sodium, and unhealthy fats (Caporuscio, 2020). Areas with a high concentration of fast-food restaurants are designated as food swamps. Food swamps differ from food deserts and are a stronger predictor of obesity rates among people in the United States. This translates to mean that a high density of fast-food stores will outweigh the presence of a grocery store in a neighborhood (Cooksey-Stowers et al., 2017).

Community-Driven Strategies to Overcome Food Access Barriers

Community-Driven Development (CDD) seeks to give communities and locally elected bodies the power, information, and skills to determine what is the best use of development resources and control of decisions. CDD is based on principles like local empowerment, decentralization, downward and horizontal accountability, transparency, learning by doing, or enhanced local capacity. The purpose of engaging in CDD is to empower communities, increase capacity for local development and governance, and to improve social cohesion. The underlying idea is that local communities are best suited to identify their development priorities and the corresponding solutions. When control of decision making is given to communities, better project design, better targeted and more equitably distributed benefits, fewer opportunities for corruption, which would arguably lead to more cost-effective delivery of project inputs are noted (Bennet and D'Onofrio, 2015).

The Partnership in West Tallahatchie County, Mississippi proposed several ideas to overcome barriers to food access including a mobile market, expansion of existing farmers' markets, cooperative grocery store creation, community gardens, farming assistance program

development, and healthy corner store initiative support (Bengtson, et al., 2016). A team of five graduate students from the University of Michigan found that most initiatives lack cohesion among stakeholders or buy-in from the larger community (Bengtson, et al., 2016). In Bolivar County, Mississippi, The Good Food Revolution worked to create a network of high-needs communities to access healthy affordable food (Hossfeld & Mendez, 2018). This project supported and helped to grow and produce local food to expand the local economy, generate jobs, and increase nutrition (Hossfeld & Mendez, 2018).

Another effort in Holmes County, Mississippi is the Mileston Farmer Cooperative, known as the Mileston Cooperative Association or MCA (Hossfeld & Mendez, 2018). The MCA consists of 13 African American farmers considered socially disadvantaged who work in a cooperative along with students in a youth training program (Hossfeld & Mendez, 2018). The MCA grows a variety of specialty crops which they sell locally through farmers' markets and directly to consumers (Hossfeld & Mendez, 2018). The goal or mission is to

enhance the quality of life and health for low-income citizens through economic and community development initiatives, primarily through creating a trained workforce of young people who can work in sustainable agriculture to generate economic development in the high-poverty county and to increase access to healthy food for Holmes County residents who need it (Hossfeld & Mendez, 2018, para. 28).

Food-Based Approaches to Overcome Malnutrition

To eliminate micronutrient deficiencies, more support from the community is needed. With community driven demands and support, appropriate food behavior changes can be made. Food-based approaches do have a strong potential for reducing and for eliminating malnutrition

(Tontisirin et al., 2002). Health is recognized as a strong motivator for changing eating habits that can even lead to changes in the types of meat that are commonly consumed. Western consumers have been changing their dietary habits towards healthy and nutritious foods. The increasing interest comes from raising consumers' awareness of the close relationship between food and health and the role of specific nutrients that enhance body functions. Meat is widely known for providing high biological value proteins, fatty acids, vitamins, minerals, and other essential compounds which ensure optimal health. The nutritional quality of rabbit meat fits into the health requirements of the modern consumer and it has also been recommended for children by the World Health Organization (WHO) (Cullere & Zotte, 2018).

Choosing rabbit to add to diets is largely a societal element and is affected by a variety of factors including ethnicity, cultural background, age, gender, degree of urbanization, and socioeconomic status. In Turkey for example, rabbit meat is rarely consumed due to religious and cultural restrictions. The Mediterranean region has a rich history of cuniculture and still has a culinary fondness for rabbit meat today. Spain also consumes rabbit meat quite frequently (Petracci et al., 2018). Current consumption of rabbit meat in the United States is small. The United States population is wealthier, older, more educated, and more ethnically diverse than in the past.

Perceptions of Non-traditional Food Consumption

The word "perception" is part of our everyday language and its impact on an individual's decision-making is irrefutable (Abercrombie, 1966). Progressively more people are motivated by what they feel or what they perceive their needs or wants to be rather than by rational thought processes. A particular situation to one person can be viewed as a problem while to another it can be viewed as an opportunity. In South Africa, rabbit meat added to daily diets could improve

food security and nutrition. The malnutrition challenge in urban and rural areas of South Africa poses a choice to the people there to either view the consumption of this non-traditional food source as either positively as an opportunity or negatively as problematic (Nolwandle, 2021).

Consumers represent the final link in the food chain. Better perceptions drive better acceptance. Consumers' choice of rabbit meat consumption to satisfy the needs/wants for nutrition security reflects their positive feelings or perceptions towards that entity (Andriani et al., 2015). Gonzalez-Redondo et al. (2010) noted that some societies do not recognize rabbit meat as an agricultural livestock intended for human consumption but view or perceive it instead as a game meat or as a pet.

Backyard or Subsistence Farming of Meat Animals

The Merriam-Webster dictionary defines subsistence agriculture as a system of farming that provides all or almost all the goods required by the family without any significant surplus for sale. This definition can be compared to the self-sufficient farming definition, which says self-sufficient farming is being able to maintain oneself without outside aid and being capable of providing for one's own needs. The premise of traditional subsistence farming is based on doing things naturally, with little impact to the environment, and at a low cost. Modern subsistence farming is viewed as a part of self-sufficiency. The subsistence farmer today seeks to produce what they grow by using little inputs (Undlin, 2019; Vanorio, n.d.).

The goal is to lower costs by balancing that cost with need. Subsistence farming is not just a thing of the past but also a look toward the future. Living simply and providing for your own needs gives a sense of accomplishment and can provide benefits to both the planet and financially to the farmer (Undlin, 2019; Vanorio, n.d.). According to Vanorio (n.d.) and Undlin (2019), subsistence farming starting as a transition from nomadic foraging to living in semi-

permanent villages and to the domestication of plants. Subsistence farming led to less variety in diets but greater quantities. Advantages of subsistence farming includes little outgoing costs, less waste, more natural, and no transportation of crops because the food is for the family rather than for sale. Subsistence farming does have disadvantages. Some of these are limited labor and tools, higher incidence of disease especially among children, weather could have catastrophic impact. Subsistence agriculture can be used as a strategy to alleviate poverty especially in developing countries. It can also serve as a safety net for food price shocks and for food security (Janvry & Sadoulet, 2011). Although subsistence farming is thought to exist only in developing countries, more people are returning to this method of farming (Vanorio, n.d.).

Cattle, poultry, and rabbits are often raised in backyard subsistence farming schemes. Raising cattle requires more land than rabbits or chickens but does allow the growing of your own grass-fed beef (Norris, 2022). Poultry help control pests, reduce food wastes, provide families with eggs and garden clearing and fertilizer while proving to be simple to care for and to maintain. Chickens, however, are noisy and smelly and will live much longer than they will produce eggs (Why Should You Raise Backyard Chickens, 2022). Rabbits can be reared in cages in back yards and do not require a lot of space or land for production. Rabbits do not have to be fed commercial feed. Feeding commercial pellets will raise the cost of production. Rabbits can perform well even on poor forages and have a great feed conversion efficiency. Weeds, alfalfa and other grasses, discarded fruits and vegetables from home or grocery stores will still result in quality meat (Gidenne et al., 2009). There are challenges associated with raising rabbits though. Some challenges include heat, disease, predators, and fright (Backyard Chickens, 2014).

Rabbit Production

Raising rabbits started in the West Mediterranean area and is still very popular there today. In areas like Asia, the Western part of Northern Africa, the Nile delta, and some South American countries as well as in Mexico and the Caribbean Islands, raising rabbits is also common. In areas where rabbit rearing is not traditional due to culture or scarce resources and low thermotolerance of the species, it can be difficult to introduce such practice. However, raising rabbits should be considered as an important contribution to assure food security. Its diffusion and antiquity are proof of sustainability when raised in backyards (Finzi, 2002).

Rabbits are a great choice of livestock for small and urban farms. They do not take up much space, are very quiet, and when managed correctly can provide meat, pelts, and possibly fiber for your family. Rabbits can be one of the most efficient protein sources. They are also an ideal livestock to keep in an urban situation because they need little space, are quiet, and can be prolific (Robles, n.d). Most meat rabbits, like the New Zealand White and the Californian, are raised off the ground in hutches or hanging wire cages, but colonies on the ground are becoming popular for animal welfare concerns. Rabbits can be fed store bought pellets and hay or even raised on pasture. Gestation is 28-35 days with does induced by bucks any time during the year. A pair of meat rabbits can produce 72 kits per year or 200 pounds of meat (Ethical, Humane, & Conscientious Rabbit Stewardship, 2021). Barriers to integrating rabbits to backyard systems include defense against predators, building and maintaining equipment, proper genetics, best animal practices, and access to proper feeding (Finzi, 2002).

The History of Rabbit Consumption in the United States

Rabbits are lean protein that are low in cholesterol and are easy to raise. During World War II with rationing in effect, prime meats like beef were not always available (Rhodes, 2011).

Touted as a patriotic food, rabbits were raised by thousands of Americans in their backyards. Victory gardens and rabbits helped put food on tables when much of the nation's food supply was shipped to soldiers overseas (Carter, 2014). By the 1960s, however, most Americans had abandoned the notion of raising and consuming rabbit meat (Rhodes, 2011). With the 1960s came the rise of the middle class, the feminist movement, and the thought that all families needed a pet (Thompson, n.d.). Even though rabbit consumption spiked during World War II, it all but disappeared afterward (Carter, 2014) and has been replaced with a luxury meat like beef (Muth, 2013). With increasing consumption of fatty meats like beef have also come increasing rates of high blood pressure, high cholesterol, heart disease, and type II diabetes (Zimney, 2009 and Song, et al., 20040).

Rabbit Nutrition Facts

Concern about healthy lifestyles today maintains one of the most influencing trends in food buying behavior in consumers (Escriba-Perez et al., 2017). Rabbit meat is rich in protein with high levels of essential amino acids, and it is in low in fat with a favorable proportion of saturated, monosaturated, and polyunsaturated fatty acids. Rabbit provides a moderate amount of energy which is mostly derived from meat protein. It is low in cholesterol and sodium. Additionally, rabbit meat is a good source of potassium, phosphorus, selenium, and B vitamins, particularly being one of the richest sources of vitamin B12. Furthermore, because the rabbit is a monogastric animal, any dietary changes and or supplementation with health-promoting ingredients are effective tools which can further improve the nutritional quality of the meat (Cullere & Zotte, 2011, 2018).

Current Trends

Current trends in consumer choice and purchasing decision are geared toward food safety and healthy, quality meat products. Consumers are demanding leaner carcasses with lower fat content and high protein quality (Hernandez & Gondret, 2006). Freshness, taste, and juiciness of the meat are other highly regarded attributes that influence consumption choices (McLean-Meynsse et al., 1994).

Price is an important cue for consumers when deciding the quality of meat. The place meat is purchased is another important factor in the decision equation. According to Tolosana et al. (2005), consumers' preference for meat purchased directly from the farmer or butcher was observed as a result from the belief that purchasing directly from the producer is cheaper than buying from supermarkets and the meat is fresh and of excellent quality.

According to Michael Uetz, Midan Marketing principal, the COVID-19 pandemic drove more consumers to order beef in restaurants and made everyone more likely to experiment with new cuts and recipes at home. Uetz divided the meat market into different target sectors based on attitudes, values, and behaviors: The Protein Progressives who enjoy all protein but especially meat, The Family-first Food Lovers who like to cook and prefer grass-fed over grain fed, The Aging Traditionalists who prefer conventional meat and want to know the nutrient values, The Convenience Chasers who enjoy convenient, cheap meals with little interest in health claims, and The Wellness Divas who focus on health and meat nutrition (Uetz, 2021). Uetz also noted that trust is lacking in the meat industry today with only 33% of young consumers trusting the food industry. Rabbits can be grown on urban farms very close to where they will be eaten. This lends itself to the transparency that is important for accountability. Here the food buyer and the food producer are ideologically in line (Andrews, 2021).

In an article titled “Meat Industry Predictions for 2021” supply chain (Forde & Boyle, 2020). Shoppers looked to specialty meats at higher rates due to heightened attention to health and wellness as well as meat raising practices. The categories which saw the most interest included “No Antibiotics Ever,” “Free Range,” and products with animal welfare it notes that meat sales came in higher throughout the pandemic. Beef was a large focus generating 61% of new fresh meat dollars between March and July of 2020. The demand for high-end beef served in restaurants did see a decline while farmers and processors struggled to cope with changing levels and types of demand from different sectors. The greatest impact of COVID-19 on the livestock product supply chain started with the disease outbreaks among processing plant workers, which lead to plant closures. These closures affected ups and down in the food claims (“Meat Industry Predictions for 2021”, 2021). In a year when the pandemic challenged where, how, and what was eaten, meats suited for small scale backyard operations offered an escape from the industrial meat supply chain problems (Forde & Boyle, 2020).

Societal Perceptions

Socioeconomic status plays a major role on consumers’ perceptions. In most developing countries like South Africa, a large population live below the poverty line. This makes them more vulnerable to diseases due to the low consumption of protein, essential amino acids, and other essential minerals. Rabbit meat is considered a functional food because it provides bioactive substances with favorable effects on human health. Despite its health benefits, the consumption of rabbit meat in developing countries like South Africa, Nigeria, Botswana, and Kenya is quite low when compared to developed countries in Europe, Asia, and North America (Hernandez & Gondret, 2006). Throughout the developed world, meat is the most important

source of protein followed by cereals. In developing countries, this order is reversed (Moreki & Seabo, 2012).

Other societal factors include sex. In a study by Beale et al. (2004), it was concluded that rabbit meat consumers are mostly men over 36 years of age with an income below \$50,000. Broadly, the Pew Research Center defines middle class socio-economic status households as making two-thirds to double America's median income. That income range would include Americans earning anywhere from about \$30,000 to \$90,000 (Kaplan & Hoff, 2022). Lower class socio-economic status would fall below that \$30,000 mark while upper class status would be above \$90,000 leaving that middle portion to designate middle class. In a study by Hoffman et al. (2004), black people associated rabbits with hunting and wildlife and also perceived rabbit hunting more suitable for males than females.

Potential Barriers

In certain parts of the world, like South Africa, few rabbit farms and abattoirs are available to slaughter and process the available rabbits. Rabbit meat has not yet penetrated the general population as an alternative to chicken meat (Hoffman et al., 2004). Also in South Africa, rabbit meat is not accessible to the general population because it is mostly produced by small holder farms for their own consumption. Many societies, including those within the United States, do not recognize rabbit meat as agricultural livestock for human consumption. Instead, rabbit is classified as wild game and are exempt from the Humane Methods of Slaughter Act (Andrews, 2021). More and more rabbits are being viewed as pets (Costell et al., 2010). Mark Pasternak (year) noted that rabbits do breed like rabbits, but they also die like rabbits falling prey to disease in factory-farm settings. Rabbits are very labor intensive on a commercial scale (Andrew, 2021).

Qualitative Research Methodologies

Qualitative research acts as a broad term for a plethora of research methodologies, all which give reference to the theoretical, political, and philosophical backgrounds rooted in social research and to their implications for research practice. These references play a dominant role for the use of research methods. Methods are those techniques researchers use to acquire and to analyze data to create a body of knowledge. So, methodology guides a strategy of procedures when an enquiry is performed. A broad range of methodologies exist but some of the most commonly used include grounded theory, case study, phenomenology, ethnography, and narrative research (Petty et al., 2012).

Following the determination of a methodology, the appropriate methods are decided. Here, a sampling method, data collection, and analysis comprise the core elements. A common sampling method is purposive which seeks out information-rich cases. The researcher may want to use purposive sample to diversify or vary participants to gain a deeper understanding of the data (Johnson & Watererfield, 2004). Interviews are widely used in qualitative research as a method for collecting data and may be structured, semi-structured, or even unstructured (Robson, 2011). Semi-structured interviews differ from structured and unstructured interviews, giving way to allowing the researcher to have pre-determined areas of interest but allow the researcher to follow the direction of the participant. Initial interviews can be conducted face-to-face, by phone, or on the internet. These interviews are usually 30-90 minutes long and audio-taped for later transcription (Petty et al., 2012).

Observations are also a part of data collection and can be formal or informal. Typically, qualitative studies use informal participant observation. Here, the researcher interprets the data that is seen (Robson, 2011). Observations can be time consuming but can also be used to hear

and to see exactly how individuals act or interact in the context of the research study (Petty et al., 2012). Document analysis can also be included as an avenue for data collection. Written documents could take the form of photographs, drawings, pictures, articles, etc. It is important to identify the context of the document (Petty et al., 2012).

A mix of data collection methods are appropriate for any qualitative study. Once the data is collected, the researcher typically moves back and forth between data collection and analysis. While software like NVivo exists offering a powerful data management system, it is the researcher who ultimately is left analyzing the data. Usually, the researcher will begin with codes to identify patterns and relationships within the data. Rigor of qualitative research is commonly qualified differently from quantitative research. Commonly accepted criteria include confirmability, dependability, credibility, and transferability (Guba & Lincoln, 1981).

According to Yin (2003), a case study design should be used when the study's objective is to answer "how" or "why" questions, the behavior of participants cannot be manipulated, the contextual conditions need to be covered because they are relevant, and the boundaries are unclear between the phenomenon and the context. Next, the type of case study should be determined according to the overall purpose of the study: to describe a case, explore a case, or compare between cases. Once the case has been decided, additional design components should be contemplated. One such component is the application of conceptual frameworks (Yin, 2003; Miles & Huberman, 1994).

Theoretical Framework

Rogers' Diffusion of Innovations

Developed in 1962, Rogers' Diffusion of Innovations (DOI) is one of the oldest social science theories. It had its start in communications to explain how, over time, an idea or product

gains momentum and diffuses or spreads through a specific population or social system. The result is that people who are part of a social system adopt a new idea, behavior, or product.

Rogers argued that diffusion was the process by which an innovation was communicated over time among the participants in a social system. There are four main elements that influence innovation:

1. The Innovation Itself
2. Communication Channels
3. Time
4. A Social System

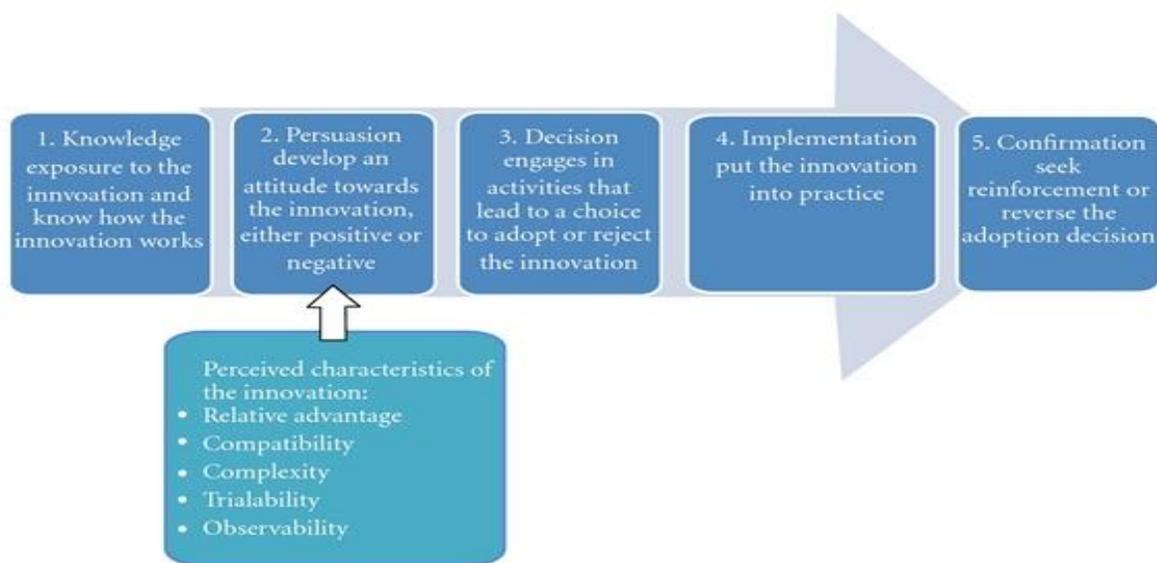
Adoption means a person does something differently than what they had previously, like purchasing or using a new product or acquire/perform a new behavior. The key to adoption is that the person must perceive the idea, behavior, or product as new or innovative. This is what makes diffusion possible. There are five adopter categories measured by the time an innovation is adopted. These categories include innovators, early adopters, early majority, late majority, and laggards. It is important to note that innovation times are continuous. The rate of adoption is influenced by five factors or attributes:

1. *Relative advantage* – the degree to which an innovation is seen as better than the idea, program, or product it replaces
2. *Compatibility* – how consistent the innovation is with the values, experiences, and needs of the potential adopters
3. *Complexity* – how difficult the innovation is to understand and/or use
4. *Trialability* – the extent to which the innovation can be tested or experimented with before a commitment to adopt is made
5. *Observability* – the extent to which the innovation provides tangible results

The innovation stages of the innovation-decision process are the Knowledge Stage, the Persuasion Stage, the Decision Stage, the Implementation Stage, and the Confirmation Stage. However, adoption can be interrupted at any time (Rogers, 2003).

Figure 1

Rogers' Diffusion of Innovation: the five stages in the Innovation-Decision process.



Interaction Effect

In any study, many factors can affect the intended outcomes. An interaction effect is the simultaneous effect of two or more independent variables on at least one dependent variable in which their joint effect is significantly greater or less than the sum of the parts (Frost, 2021). The interaction effect is included in this research to provide the researcher with a better representation and understanding of the relationship between raising backyard meat rabbits before, during, and after the COVID-19 pandemic. The omission of the interaction effect could

result in a misrepresentation of the results. The interaction effect could also provide a foundation for future research in both quantitative and qualitative approaches.

Summary

Despite rabbit as an easy-to-raise, healthy food choice, its consumption rates fall behind that of beef, pork, and chicken (United States Department of Agriculture, 2020). When compared to beef, pork, and chicken, rabbit has fewer calories and more protein. Globally, trends in obesity continue to rise and often exist in the same populations as undernutrition. Nutrient insecurity is still a challenge in the United States with Mississippi rated as the fattest state overall (Pesce, 2019). Public health agencies recognize these obesity trends among populations as a priority and explain the patterns as linked to environments and societal trends that encourage overeating and less physical activity. Obesity prevention and nutrition intervention focus mostly on changing individual level eating behaviors. Behavior-based nutrition education approaches targeting changing population eating patterns have met with limited success (Delormier et al., 2009).

CHAPTER III

METHODOLOGY

Introduction

Malnutrition presents a double burden of both obesity and undernutrition within the same populations (Toole, 2016). A need exists for integrated programs that address micronutrient deficiencies while simultaneously combating larger issues of food insecurity and malnutrition in local communities as well as in communities abroad (Tontisirinet al., 2002). Food-based approaches have a strong potential for meeting the challenge of reducing or eliminating micronutrient malnutrition (Tontisirinet al., 2002). Key challenges include making the elimination of micronutrient deficiencies more demand (community)-driven with support for appropriate food behavior change (Tontisirinet al., 2002). Rabbit consumption aids a varied and balanced diet, but its consumption falls behind other protein sources like beef, pork, chicken, and turkey (Petrescu & Petrescu-Mag, 2018). Understanding consumers' perceptions of rabbit meat consumption could improve support and adoption of local rabbit consumption both in the U.S. and abroad. This chapter will include the methodology components of the study: purpose of the study, research objectives, research site and description of participants, and procedures followed for data analysis.

Purpose of the Study

The purpose of this qualitative study was to understand the influence of backyard grower-consumer perceptions on the consumption of rabbit meat in the state of Mississippi. A qualitative

study was used in both an exploratory context as well as in an explanatory context to understand not how much or how many people are raising and/or consuming rabbits but instead the who, why and how of raising, processing, and consuming rabbit meat. The results provided a description of underlying reasons, opinions, and motivations in addition to insights into consumer's demand for a meat rabbit market.

Guiding Research Questions

This study addressed the following guiding research question:

1. What were the perceptions of backyard rabbit growers in Mississippi? More specifically, this researcher wanted to understand the influences affecting growers' decision to raise rabbits and to utilize them as a protein source.

2. How were growers' practices, relative to rabbit rearing and consumption, affected by external variables outside of the growers' control?

Why Qualitative?

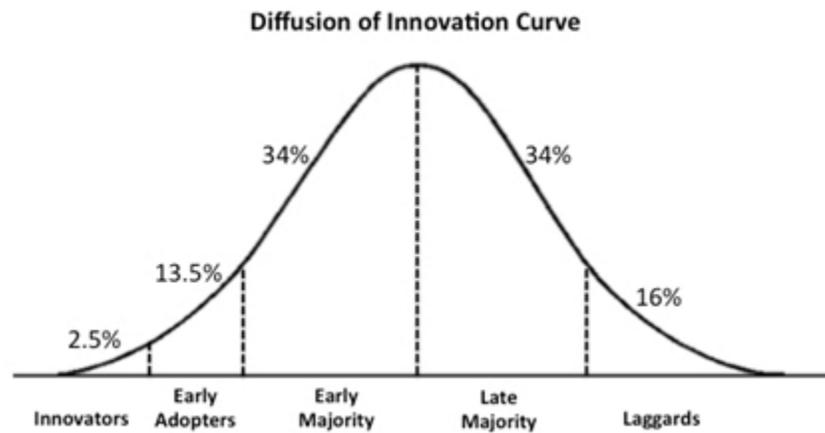
While malnutrition continues to exist along with the health disparities that accompany it, the exploration of perceptions of those raising, processing, and consuming meat rabbits in their backyards in the state of Mississippi could provide valuable insights regarding the adoption by others of such practices. Quantitative studies have been done to show consumption of rabbit meat compared to other animal protein sources as well as to show who is more likely to consume rabbit meat (Petrescu & Petrescu-Mag, 2018; United States Department of Agriculture, 2020; Wang et al., 2013). No qualitative study exists to understand the mindset or perceptions of those individuals who have adopted raising, processing, and consuming rabbit meat.

Simon Sinek in his book *Finding Your Why* says that 100% of people know what they do and some know how they do it (Sinek, 2017). Very few, however, can communicate “why” they do something. Sinek (2017) explains that your “why” is not to get paid, but is instead your purpose, cause, or belief. He uses what he calls the Golden Circle (see Figure 2) to illustrate why some individuals, companies, organizations are able to inspire, and others are not. This image represents how inspiring individuals think which is from the inside out while those that do not inspire, think from the outside in or from the obvious or clearest reasons to the fuzziest. Communication from the inside out is what drives behavior. Sinek continues by saying that people do not buy or adopt what you do but instead why you do it. The goal is to do business with those who believe what you believe – not those that have what you need.

This way of thinking is pertinent to the Diffusion of Innovations. The law of diffusion tells us if you want mass-market success or mass-market acceptance of an idea, you cannot have it until you reach the tipping point (See Figure 2). The tipping point is found between 15-18% market penetration. This gap is found between early adopters and the early majority.

Figure 2

Diffusion of Innovation Curve illustrates the stages of diffusion and the percentage of the market at each adoption stage



This qualitative study offered insights into what participants believed to be important about raising, processing, and consuming backyard meat rabbits or simply “why” they raise, process, and consume backyard meat rabbits. Understanding their perceptions could help rabbit programs cross the adoption chasm and reach the tipping point for mass-market penetration. Adoption of raising, processing, and consuming backyard meat rabbits has the potential to mitigate malnutrition in the state of Mississippi.

Research Site and Description of Participants

The research site for this study was within the state of Mississippi. By using Mississippi, the researcher was able to conduct semi-structured interviews as well as conduct observations and collect artifacts from participants.

A purposive sample of five participants was used for the study with each participant qualifying by:

1. Raising meat rabbits in their own backyard in rural Mississippi
2. Processing meat rabbits in their own backyard with the purpose of their own consumption
3. Consuming meat rabbits raised in their own backyard

The five participants were chosen based on Creswell (1998) who recommends five to 25 participants, Morse (1994) who suggests at least 6 participants, and Boyd (2001) who believes research saturation can typically be attained with two to 10 participants for a qualitative case study. There were no specific rules when determining an appropriate sample size in qualitative research. While certain practical demands need to be met, determining qualitative sample size a priori is somewhat of a problematic approach (Sim et al., 2018).

Qualitative sample sizes should be large enough to obtain feedback for most or all perceptions. Obtaining most or all the perceptions will lead to the attainment of saturation – a more adaptive approach than setting your participant number a priori. Saturation occurs when adding more participants to the study does not result in additional perspectives or information (Glaser & Strauss, 1967). Glaser and Strauss (1967) recommend the concept of saturation for achieving an appropriate sample size in qualitative studies. Qualitative sample size may best be determined by the time allotted, resources available, and study objectives (Moran, 2013). Based on time restraints associated with dissertation research, the researcher chose to include five participants. Saturation may or may not be achieved.

Emails were sent to county/regional Extension agents across Mississippi to identify prospective participants. A follow-up phone call was made to agents to answer questions or to take suggestions regarding participants. The researcher also used social media groups featuring backyard rabbits and their consumption in the state of Mississippi as an avenue to identify

participants. The researcher explored the geographic regions and demographics of the participant pool to select 5 participants. Participants included diversity of gender, race, socioeconomic status, and location.

Data Collection

This study used a descriptive qualitative design with a triangulation approach. Using a triangulation method helped increase the validity and the comprehensiveness of the research findings. Validity reflects the extent to which the study accurately evaluates the concepts being explored. Triangulation also helped with any biases from the researcher that would have been harder to prevent using a single data collection method. Using semi-structured interviews, observations, and the collection of artifacts helped to explore and to explain the complexities of perceptions of participants who choose to raise, process, and consume meat rabbits and offered a more balanced explanation to the readers of this research. Triangulation helped confirm research findings and gave more confidence since all the methods led to the same results (Nobel & Heale, 2019).

Using a triangulation approach did have drawbacks, however, it added to the complexity of the research and made data collection and analysis more time-consuming. Sometimes triangulation may not be used in a uniform or consistent manner. In this study, observation and the collection of artifacts proved to be of a lower proportion to each of the interviews if considered separately (Nobel & Heale, 2019).

Each participant was interviewed twice with first a 60-90-minute semi-structured interview and then a 30-minute semi-structured follow-up interview. A 60-minute observation of each participants rabbitry and a collection of artifacts also sought to explore and to explain participants' perceptions surrounding raising meat rabbits in their backyard, processing these

rabbits in their backyard, and consuming these meat rabbits. Interviews include two major categories that reflected the two guiding research questions:

1. What were the perceptions of backyard rabbit growers in Mississippi? More specifically, this researcher wanted to understand the influences affecting growers' decision to raise rabbits and to utilize them as a protein source.

2. How were growers' practices, relative to rabbit rearing and consumption, affected by external variables outside of the growers' control?

Initial interview questions for the first 60–90-minute semi-structured interview were aligned with the constructs of Roger's Diffusion of Innovation. E.M. Rogers' Diffusion of Innovations (DOI). Developed in 1962, DOI is one of the oldest social science theories. It had its start in communications to explain how, over time, an idea or product gains momentum and diffuses or spreads through a specific population or social system. The result is that people who are part of a social system adopt a new idea, behavior, or product. Adoption means a person does something differently than what they had previously. An example would be purchasing or using a new product or acquiring and performing a new behavior. The key to adoption is that the person must perceive the idea, behavior, or product as new or innovative. This is what makes diffusion possible. There are five stages of adoption: innovators, early adopters, early majority, late majority, and laggards. The rate of adoption is influenced by five factors or attributes:

1. Relative advantage – the degree to which an innovation is seen as better than the idea, program, or product it replaces
2. Compatibility – how consistent the innovation is with the values, experiences, and needs of the potential adopters
3. Complexity – how difficult the innovation is to understand and/or use

4. Trialability – the extent to which the innovation can be tested or experimented with before a commitment to adopt is made

5. Observability – the extent to which the innovation provides tangible results

A second theoretical framework to guide research questions in the initial semi-structured interview was that of Interaction Effect. In asking if COVID-19 or some other similar event impacted the raising and processing of meat rabbits, the researcher could better understand how changes in social systems may affect growing protein sources in one's own backyard. This could play a role in relative advantage (DOI) as well if the participant sells excess to restaurants which were no longer open during COVID-19.

The researcher allowed two-four weeks between participants' first and second semi-structured interview to allow for transcription as well as for reflection to better structure the second interview. Reflective and analytic memos were written to help the researcher stay focused and to not succumb to any biases she had. These memos added credibility to the study. No second interviews were conducted until all the first semi-structured interviews and their transcriptions had been completed and reflections/memos were completed. Second interviews served to clarify and further pursued theory constructs and even to investigate emergent ones. The researcher did share findings from other participants' first semi-structured interviews to check reactions and/or responses. Relevant documents and observations from first interviews helped segue into more "why?" questions to participants moving further into a more meaningful discussion than the original "how?" questions from the first semi-structured interview. Waiting until all first interviews had been done allowed the researcher to reflect on emergent themes.

Observations were mapped to research questions and lasted approximately 60 minutes to allow the researcher time to look at the equipment used to house and to feed the meat rabbits.

Evaluation of the age, size, and number of cages lend itself to supporting longevity of the participants practice of raising rabbits, expansion, cutbacks, etc. The researcher also looked to see if other rabbit breeds were raised by participants besides those solely for meat purposes. If other breeds were raised, this could have drawn into question the participant's purpose in raising rabbits for only food. The research observer also looked to see if the participant was actively breeding as a check for sustaining a constant source of protein. Lastly, of great interest to this researcher was the presence or the absence of other protein sources raised for the purpose of the participant's consumption.

Photographs taken during the observation data collection along with drawings that mapped out the backyard operation also served as artifacts collected. Other artifacts of interest included recipes the participants might have shared with the researcher or butchering tools and equipment like meat grinders, freezer packaging choices, or pots for cooking. The researcher was also interested in by products like pelts, manure used as fertilizers, etc. that might have lended itself to more relative advantages.

Procedures Followed for Data Analysis

Interviews were recorded and later transcribed verbatim by the interviewer/researcher. Along with the transcription, the researcher posted reflections throughout the study. Roger's Diffusion of Innovations Theoretical Framework and the Interaction Effect Theory served as guides to create the initial nodes a priori for data analysis. Specifically, the researcher was interested in the persuasion stage in Roger's Diffusion of Innovation and included the five categories consisting of Relative Advantage, Compatibility, Complexity, Trialability, and Observability as well as the Interaction Effect Framework title as initial nodes for analysis. Social Systems, Communication Channels, and Change Agents defining Roger's Diffusion of

Innovation created interest in the mind of the researcher and these were also used as initial nodes for analysis. After the initial nodes were created, a second tier of nodes were established from the interview responses, the observations, and the collection of artifacts. In a few cases, a third tier of nodes emerged.

NVivo 12 was used by the researcher for data analysis. NVivo 12 is a qualitative data analysis application allowing researchers to collect, organize, analyze, and visualize data. Data was imported from a range of file formats. Interviews, observations, artifacts, drawings, and reflective memos were uploaded to NVivo 12. A hybrid approach using the nodes created a priori as well as building nodes during analysis added both deductive and inductive components to the study. The first level of nodes reflected the theoretical frameworks.. All data was then coded using these nodes. A second layer of nodes was then added to create a tiered hierarchy to further explore the most noteworthy references based on coding and to show deeper relationships. For example: Relative Advantage was a first level node used for coding and Valuable, Healthy, Self-Sufficiency were some nodes that comprised the secondary level. Following data analysis using NVivo 12, the researcher took advantage of the data analysis application's ability to create graphs, tables, and charts so that readers could visualize results more easily.

Epoché and bracketing along with journaling and an audit trail were sought to minimize researcher biases. The researcher does raise meat rabbits in her backyard, processes them, and consumes them. The researcher's experiences served as a knowledge base for understanding vocabulary and practices participants were using. By acknowledging she may have had preconceived ideas regarding the nutritional benefits and ease of raising meat rabbits for consumption, she first admitted those through bracketing and used journaling to express her

thoughts and feelings during data collection. She met several times each week with her advisor either in person or via phone to check her interpretations.. Through memos, drawings, interviews, observations, illustrative examples, and the collection of artifacts, the researcher strove for credibility with the addition of rich, thick descriptions.

CHAPTER IV

RESULTS

Introduction

This study sought to address the following guiding research questions: 1. What were the perceptions of backyard rabbit growers in Mississippi? More specifically, this researcher wanted to understand the influences affecting growers' decision to raise rabbits and to utilize them as a protein source. 2. How were growers' practices, relative to rabbit rearing and consumption, affected by external variables outside of the growers' control? A qualitative study was chosen for both an exploratory context as well as in an explanatory context to understand not how much or how many people were raising and/or consuming rabbits but instead the who, why, and how of raising, processing, and consuming rabbit meat. Rogers' Diffusion of Innovation Theory was chosen as a framework to guide the researcher through the various stages of the adoption process: knowledge, persuasion, decision, implementation, and confirmation with a focus on the persuasion process since participants had already made the decision to raise meat rabbits in their backyards for personal consumption. The Interaction Effect was another framework the researcher considered resulting from the recent COVID-19 pandemic.

This chapter presents the findings of the study in two ways. First, it provides a within-case analysis for each of the five participants. The within-case analysis for each participant is based only on information obtained from artifacts, observations, and participant interviews. After the within-case analysis, findings are reported in a cross-case analysis. This section presents

results that are common across the five participants and is based on artifacts, observations, and interviews.

Within-Case Analysis of the Five Participants

The within-case analysis for each of the case studies begins with a detailed description of the participant and their rabbitry. This description also provides important information about the personality and characteristics of each of the participants. The within-case analysis provides individual results of each case and is organized by the two guiding research questions.

Participant One: Kevin and Amy Green

Kevin Green is a 44-year-old white male living in Leake County, Mississippi with his wife Amy. Kevin has an associate degree plus training needed for his job as Chief Welding Inspector. Kevin classifies himself as middle class. Kevin and Amy have one child together – Claire – but have other children from previous marriages. Kevin frequently works out of town while his wife Amy has a t-shirt business and works from home. At the start of data collection, the researcher planned to interview Amy because Kevin was out of state working. The researcher visited the farm and conducted the first semi-structured interview. Amy provided many insights, but she made it clear to the researcher that Kevin, though out of town much of the time, was the brains of the rabbit operation. Amy showed me around the farm for the first observation, but then she dropped out of the study and the researcher continued with Kevin.

Kevin and Amy started raising rabbits about two years ago. They do not remember specifically where they got their first two meat mutts. They do remember it was summertime and unknowingly placed the rabbits in a hutch in full sun. They lost these first two rabbits because of the heat. At the beginning of last year, their son-in-law gifted them two rabbits. Amy told me that

Kevin wanted to get into rabbits because it would keep the kids entertained and because they were getting to the point of being dependent on themselves rather than on the grocery stores. They do not know “where the world is going at this point and want to be self-sufficient.” Amy pointed to her son during our interview and told me he was a big deer hunter. She also showed me the chickens and the turkeys – other protein sources – they raise for consumption.

Kevin and Amy had several fruit trees planted and the researcher observed a summer garden plot which lay fallow during the winter months. Amy relayed that Kevin had pets/livestock growing up but that she was poor and did not have that privilege. Kevin’s family also raised a garden when he was a child. Kevin and Amy preserve the fruits and vegetables harvested during the summer.

Currently Kevin and Amy raise New Zealand Whites (NZW) for meat consumption. Kevin explained that they chose NZW because they were easy to find close to where they lived. They also raise miniRex, lionheads and meat mutt rabbits. The miniRex and lionheads are usually sold for pets and help with expenses for the meat rabbits. Their rabbits are housed in individual cages inside a wooden barn structure that already existed on their property. Kevin designed the cage system which was constructed from used wire shelving. Fans were strategically placed to keep each rabbit cool in the heat. Kevin had also installed an automatic watering system and a manure collection system to make taking care of the rabbits easier on Amy.

Kevin and Amy shared their perceptions of raising meat rabbits, saying they’re a lot healthier – you know what they’ve been fed and the conditions in which they are processed and stored. Amy said, “I’m eating things that I know.” Amy said they do not spend a lot on feed and Kevin calculated it took about 15 minutes a day to feed and care for the 15 breeding age rabbits

they have. They use the rabbit manure in their summer vegetable garden. Kevin and Amy like raising protein sources and feel they would be a valuable bartering tool but also raise fruits and vegetables.

Kevin and Amy also talked about the recent COVID-19 pandemic's effect on their perceptions of raising rabbits saying, "Since Coronavirus happened it made you realize that sometimes you may not be able to just run to the store and pick up what you need. So, you can be more self-sufficient and running your life around that. We do want to get more into the breeding of the New Zealands more for consumption and then selling out to other people. We've had a lot that have asked us for rabbits."

Participant Two: Joe Buck

Joe Buck is a 50-year-old white male raising rabbits on his farm in Holmes County, Mississippi. Joe has a business degree from a four-year institution. He is retired and classifies himself within a high socio-economic bracket. Joe told me he started raising rabbits 8-10 years ago, prompted by his daughter who expressed an interest in getting rabbits for long-term sustainability. Joe started off with 12-15 rabbits that were all from show quality stock to "start with a strong foundation" and "build from there."

Joe perceived rabbits to "take up very little space" with a "very quick turn around." He also commented that the amount of food you're putting into them versus the output is very favorable. Rabbit, he told me, is higher in protein and lower in saturated fats and cholesterol. The elevated cages make it easy to keep the area sanitary and the droppings are great fertilizer. Joe felt growing protein sources has an advantage over growing fruits and vegetables because protein is harder to come by. Joe also mentioned protein sources were better for bartering. Joe said the

Pandemic had a net positive effect on his rabbit operation because it really allowed him and his family to spend more time farming since things closed down.

While Joe does raise fruit trees, he does not have a garden and he does not preserve any fruit from the fruit trees. Joe's family did raise a few tomatoes growing up as well as pets and livestock like horses but none for consumption. Joe raises chickens, turkeys, donkeys, and horses but none of these are for consumption.

Participant Three: Darci Blount

Darci Blount is a white, 46-year-old female who raises rabbits in Hinds County, Mississippi. Darci has a college degree plus additional educational years and is a teacher over Elementary Education at Delta State University. Darci identifies herself as middle class. She started raising rabbits about ten years ago with two males and two females that she bought for herself after researching breeds of meat rabbits. When asked what made her look for meat rabbits Darci responded,

We wanted something we could easily grow that we wouldn't have to worry about vaccinations and that weren't a lot of upkeep – that they were easy to raise, that they were manageable for us because at the time my kids were really young. I didn't have time to chase cows around. I really didn't want chickens. We live out here as a community. My mom has chickens, so we were thinking about how we could complement one another and if the economy went South – things got really expensive and we had to live off the land – you know you never know, we're not extremists, but you always want to be prepared if something happened.

Darci continued by telling me that rabbits reproduce frequently and multiply a lot. She also shared that she really did not have a lot of space. Darci noted that her family always had

chickens growing up and she had a pet rabbit. Compared to chickens and other livestock, Darci felt raising rabbits was very cheap – “you don’t have a lot of equipment or a pasture to fence.” Darci talked about the perceptions of others regarding rabbits as pets. She said, “These grow outs, they are not your pets. It’s just like if I had chickens or pigs to harvest. We are raising them to eat.”

One of Darci’s greatest challenges was getting used to dispatching the rabbits. She said, “At first, it was really hard and then I got used to it. It was tough.” A second challenge was not knowing what to do with the pelts, so she just throws them away. Darci also spoke of ear mite issues, predators like neighboring dogs, and does kindling outside the dropdown nest boxes as problems she had encountered. Her initial cage design was the costliest expense she encountered. She said the biggest thing was just trying to “protect them from the weather without totally enclosing them due to the hot summers in Mississippi.

When I asked Darci if COVID-19 had an effect on her production, she told me that initially it did not, but that “COVID plays mind games with you as well.” She said, “I just didn’t feel like doing any of that mess. I just wasn’t motivated. I didn’t want to have to worry about checking on does wondering if they had had their babies and if they were warm. Now,” she says, “it is affecting us because of inflation. That’s why I think it’s time to start breeding again.”

Darci’s family did raise a garden in the summers and Darci commented that some years she tries to have one. However, she is not currently gardening fruits or vegetables. Also, when Darci does harvest her rabbits, she usually eats them fresh rather than freezing them for consumption later.

Participant Four: Don Smith

Don Smith is a white, 59-year-old male who raises rabbits in Pearl River County, Mississippi. He is a retired police officer with no college education. He associates himself as middle class. He currently has 14 rabbits he uses for breeding stock. He raised chickens for eggs before adopting rabbits for protein. He said,

We didn't like the way things were looking with the direction of the country. And especially with things after the Pandemic with the shutdown of some of the meat packing companies to the point – without trying to sound like conspiracy theory – but when it comes to feeding my family, I'm not trusting everybody else. You know, I want to make sure that my family is fed. So, we are just trying to do what we can on the level we can to increase our self-sustainability.”

Don chose rabbits because:

they take up a small amount of space, the feed conversion ratio to meat is one of the best of any meat animal, its by-product with manure, they're quiet, it's pretty simple – you don't have to do a lot to care for them. Just some basic stuff. It was pretty easy to set up with the cages.

Don started with some rabbits that were gifted to him by a nearby friend but now only raises NZWs. The friend told Don that rabbits were:

easy, they produce a lot of meat, you don't have to do a lot to them, they can tolerate the cold a lot more than they can tolerate the heat. Try to keep them as cool as possible in the summer. It's good food. It's low-fat food. It's not very difficult to do and it's easy to get started.

Don admitted that he increased his numbers during the pandemic and wonders if he increased too much. He says it's "a constant adjustment based on what you need because you don't want to waste food. I'm going to adjust down a little bit." Perceived challenges are hurricanes, severe cold – both weather-related – and breeding. Predators have been an issue with his chickens, but not with his rabbits.

Don raised other protein sources for consumption before raising rabbits. He also noted that he had pets/livestock that he raised as a child. His family did not garden when he was a child, and he does not have a vegetable garden. He has started some fruit trees, but so far has not preserved any fruit.

Participant Five: John Woods

John Woods is a black, 69-year-old male who raises rabbits in his backyard in Oktibbeha County, Mississippi. John is retired from the military and has no college education. John says he associates himself with being middle class. John has a total of eight breeders in his rabbit production. John said that raising rabbits is "no problem. Clean water, clean food, and a clean pen and that's all it takes." He raises NZWs, Californians, and Cane Cutters. Cane Cutters look like wild rabbits. John says the summer heat can lead to breeding problems. He tries to monitor the heat to avoid this. The extreme cold can also present challenges. John has been raising rabbits since he was given his first rabbit as a child. He says, "The main problem is just getting past them being a pet rabbit." The wild-looking cane cutter rabbit helps with that. John commented that he sold more stuff than he wanted to sell during the COVID-19 because "everybody wanted to make sure they had some protein in their backyard." John admits the biggest problem he had at first was cleaning all the mess out but now uses one of his old hog pens and hoses down the concrete floor so that all the wastes can drain to the back. His set up now only takes him about

ten minutes each day. Comparing raising rabbits to the other protein sources John raises, he commented that “the rabbits are the one that’s easier to raise.”

John does raise other livestock intended for consumption. He also raises some vegetables but says his family did not garden when he was a child. He has no fruit trees and does not preserve any vegetables harvested.

Summary

Table 1 provides a summary of the participants’ demographic information. Table 2 provides a summary of additional information which adds to the growers’ profiles. Table 2 information was gleaned during interview 2 as well as through the second observation. During the first interview, participants reported that they raise rabbits to be self-sufficient. Upon observation however, it was noted by the researcher that most were only raising meat protein sources. In constructing second round interview questions, the researcher asked participants to define self-sufficiency. The researcher also noted how many meat rabbits were in production. The number of meat rabbits in production (breeding age) ranged from 3 to 55. Other information collected included first protein source raised, other protein sources raised whether raised for consumption or not, pets or livestock as a child, gardened as a child, raises fruits or vegetables as an adult, and preserves harvested fruits or vegetables for the off season. The researcher felt this information was pertinent to trends in populations that might be targeted for meat rabbit programs in the future.

Table 1

Demographical Profile of Participants

| | Participant 1 | Participant 2 | Participant 3 | Participant 4 | Participant 5 |
|----------------------|-------------------------|---------------------------------------|-------------------------------------------------------------|------------------------|------------------|
| Name | Kevin and Amy Green | Joe Buck | Darci Blount | Don Smith | John Woods |
| County | Leake | Holmes | Hinds | Pearl River | Oktibbeha |
| Sex | Male | Male | Female | Male | Male |
| Race | White | White | White | White | African American |
| Age | 44 | 50 | 46 | 59 | 69 |
| Education | Associate Degree Plus | College Graduate (Business Major) | College Plus | No college | No college |
| Occupation | Chief Welding Inspector | Retired Business Owner/Cattle Rancher | Teacher over Elementary Education at Delta State University | Retired Police Officer | Retired Military |
| Socioeconomic Status | Middle | High | Middle | Middle | Middle |

Table 2

Grower Profile

| | Participant 1 | Participant 2 | Participant 3 | Participant 4 | Participant 5 |
|---------------------------------------------------------|---------------------|---------------|---------------|---------------|---------------|
| Name | Kevin and Amy Green | Joe Buck | Darci Blount | Don Smith | John Woods |
| Total Breeding Rabbits | 15 | 55 | 3 | 14 | 8 |
| Rabbits were first protein source raised? | No | Yes | Yes | No | Yes |
| Other protein sources raised? | Yes | Yes | No | Yes | Yes |
| Other Livestock raised but not intended for consumption | Yes | Yes | No | Yes | No |
| Had pets or livestock as a child? | Yes | Yes | Yes | Yes | Yes |
| Family raised a garden as a child? | Yes | Yes | Yes | No | No |
| Raises vegetables as an adult? | Yes | No | Yes | No | Yes |
| Raises fruits as an adult? | Yes | Yes | No | Yes | No |
| Preserves Fruits and Vegetables | Yes | No | No | No | No |

Cross-Case Analysis

Even though the participants were selected to reflect a wide range of backgrounds and experiences, the interviews were semi-structured and open-ended in nature, and the artifacts collected varied, many commonalities across the five participants emerged regarding the perceptions of backyard rabbit growers in the state of Mississippi and the effect of external variables relative to rabbit rearing and consumption. Those commonalities reflect Rogers' Diffusion of Innovation Theory and served as nodes when analyzing the data. As summarized in Table 3, participants perceive raising rabbits in their backyards as a means for self-sufficiency whether the rabbits provide a source of food or income. Another common theme across participants was the raising of other livestock prior to raising rabbits. This commonality could have been a result of raising livestock as a child or as an adult. The five participants also shared similar perceptions associated with challenges or complexities with their decision to raise rabbits. These included the weather, breeding, and their caging systems. Table 3 shows the hierarchy of nodes for coding, the source of the data, the number of files reflecting the node, and the reference number or frequency of the node.

Looking at the analysis, there are a total of 156 references to relative advantages, 27 references to compatibility, 22 references to observability, and 4 references to trialability for a total of 209. This can be compared to 108 references for the complexities associated with the raising rabbits intended for consumption.

Table 3

Codebook Names with Files and References.

| Code/Node Name | Artifacts | Observations | Interviews | Total References |
|-------------------------------------------|-----------|--------------|------------|------------------|
| Social System | 2 | 1 | 18 | 21 |
| Total | 2 | 1 | 18 | 21 |
| Communication Channel/Change Agent | | | 1 | 1 |
| -Friend | 1 | 1 | 13 | 15 |
| -Mississippi Market Bulletin | 1 | | 3 | 4 |
| -Tractor Supply | | 1 | 2 | 3 |
| -Book | 1 | | 1 | 2 |
| -Local CoOp | | | 1 | 1 |
| Total | 3 | 2 | 21 | 26 |
| Relative Advantage | | | 3 | 3 |
| -Self-sufficiency | 9 | 1 | 4 | 14 |
| --Food | | 5 | 14 | 19 |
| --Money | | 1 | 11 | 12 |
| -Children | | 1 | 16 | 17 |
| -Easy or What You're Good At | | | 12 | 12 |
| -Healthy | | | 11 | 11 |
| -Fertilizer | 3 | 3 | 5 | 11 |
| -Prolific | | 1 | 8 | 9 |
| -Intrinsic Rewards | | | 8 | 8 |
| -Cost | | | 6 | 6 |
| -Time | 1 | | 5 | 6 |
| -Nutritious | | | 5 | 5 |
| -Clean | | 1 | 3 | 4 |
| -Efficient Food Conversion | | | 3 | 3 |
| -Fresh, Local, Community Grown | | | 3 | 3 |
| -Processed and Stored in Good Conditions | | | 3 | 3 |
| -No Disease | | | 3 | 3 |
| -Privilege | | | 3 | 3 |
| -Take up a Small Amount of Space | | | 3 | 3 |
| -Valuable (Bartering) | | 1 | 2 | 3 |
| -No Antibiotics or Vaccines | | | 2 | 2 |
| -Like to Eat/Taste | | | 2 | 2 |
| -Quiet | | | 2 | 2 |
| -Not Processed in a Store | | | 1 | 1 |
| Total | 13 | 14 | 138 | 165 |

Table 3 (continued)

| | | | | |
|----------------------------------------|-----------|-----------|-----------|------------|
| Compatibility | 2 | | | 2 |
| -Raised Other Livestock Before Rabbits | 3 | 4 | 7 | 14 |
| -Raises a Garden Now | 2 | 2 | 1 | 5 |
| -Grows Fruit Trees Now | 1 | 3 | | 4 |
| -Ate Growing Up | | | 3 | 3 |
| -Hunts | | | 2 | 2 |
| -Raised Livestock as a Child | | | 2 | 2 |
| -Raised Garden as a Child with Family | | | 1 | 1 |
| Total | 8 | 9 | 16 | 33 |
| Complexity | | | 2 | 2 |
| Weather | 6 | 7 | 12 | 25 |
| Breeding | 4 | 3 | 14 | 21 |
| Cage System | 3 | 1 | 10 | 14 |
| Perception of Others | | | 11 | 11 |
| General Health | | 3 | 7 | 10 |
| Feeding | 3 | | 6 | 9 |
| Pelts | | | 8 | 8 |
| Predators | 1 | 3 | 2 | 6 |
| Cost | | 1 | 4 | 5 |
| Processing | | | 4 | 4 |
| Finding Stock | | | 3 | 3 |
| Time Cost | | | 1 | 1 |
| Total | 17 | 18 | 84 | 119 |
| Trialability | | | | |
| -First Rabbits Gifted by Friend | | | 4 | 4 |
| Total | 0 | 0 | 4 | 4 |
| Observability | | | | 0 |
| -YouTube or FB | | | 13 | 13 |
| -Friend or Seller | | 1 | 6 | 7 |
| -Trust | | | 5 | 5 |
| -Books | | | 2 | 2 |
| Total | 0 | 1 | 26 | 27 |
| Interaction Effect | | 1 | 10 | 11 |
| -Fear | | | 5 | 5 |
| -Lack of Meat in Stores | | | 5 | 5 |
| -Inflation | | | 4 | 4 |
| Total | 0 | 1 | 24 | 25 |

Summary

This chapter presents the findings of the study in two ways. First, it provides a within-case analysis for each of the five participants. The within-case analysis for each participant is based only on information obtained from artifacts, observations, and participant interviews. After

the within-case analysis, findings are reported in a cross-case analysis. This section presents results that are common across the five participants and is based on artifacts, observations, and interviews. Table 4 summarizes the data according to the study's two guiding research questions.

Table 4

Summary of data by guiding research questions

| 1. What were the perceptions of backyard rabbit growers in Mississippi? | 2. How were growers’ practices, relative to rabbit rearing and consumption, affected by external variables outside of the growers’ control? |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Complexities</p> <ul style="list-style-type: none"> *Setting up initial cage system *Protecting rabbits from the weather (heat) *Perceptions of others *Successful breeding *General health (ear mites & sore hocks) <p>Relative Advantages</p> <ul style="list-style-type: none"> *Self-Sufficiency *Children *Easy *Healthy *Valuable *Low time requirement *Take up a small amount of space *Quiet *Prolific *No Disease *Efficient food conversion *Low cost *Clean *Fertilizer (droppings) *Intrinsic rewards *Privilege *Processed and stored in clean conditions *Not a “processed food” *Nutritious <ul style="list-style-type: none"> ** Low fat ** High protein *No antibiotics *No hormones *No vaccines *Fresh *Local *Community grown *Home grown *Good Taste | <p>Participant 1—Kevin and Amy Green</p> <p>“Since Coronavirus happened it made you realize that sometimes you may not be able to just run to the store and pick up what you need. So, you can be more self-sufficient and running your life around that. We do want to get more into the breeding of the New Zealands more for consumption and then selling out to other people. We’ve had a lot that have asked us for rabbits.”</p> <p>Participant 2 – Joe Buck</p> <p>The Pandemic had a net positive effect on his rabbit operation because it really allowed him and his family to spend more time farming since things closed down.</p> <p>Participant 3 – Darci Blount</p> <p>“COVID plays mind games with you as well.” She said, “I just didn’t feel like doing any of that mess. I just wasn’t motivated. I didn’t want to have to worry about checking on does wondering if they had had their babies and if they were warm. Now,” she says, “it is affecting us because of inflation. That’s why I think it’s time to start breeding again.”</p> <p>Participant 4 – Don Smith</p> <p>Don admitted that he increased his numbers during the Pandemic and wonders if he increased too much. He says it’s “a constant adjustment based on what you need because you don’t want to waste food. I’m going to adjust down a little bit.”</p> <p>Participant 5 – John Woods</p> <p>John commented that he sold more stuff than he wanted to sell during the COVID-19 because “everybody wanted to make sure they had some protein in their backyard.”</p> |

This chapter presents the findings of the study first by providing a within-case analysis for each of the five participants then as an across-case analysis. The findings are based on information obtained from artifacts, observations, and participant interviews. This section also presents the findings summarized in tables first according to hierarchical codes and references then summarized according to the research questions.

CHAPTER V

CONCLUSIONS

Introduction

The focus of this study centered around the perceptions of meat rabbit growers in the rural backyards of Mississippi. According to Petrescu and Petrescu-Mag (2018), rabbit meat production and consumption is a possible solution to malnutrition worldwide however its consumption falls behind other protein sources like beef, pork, chicken, and turkey. Lukefahr and Cheek (1990) note that in areas not consuming or marketing the raising and consuming of rabbit meat, it is important to start a rabbit project on a small scale, family basis. There is a gap in the research in understanding backyard meat growers' perceptions of raising rabbit meat in the state of Mississippi.

Due to the nature of the guiding research questions and the gaps in the literature, a qualitative case study design was chosen. Interviews, observations, and artifacts were used to collect data. Each of the five participants were interviewed twice at their home or farm where they are raising meat rabbits. Each operation was observed, and artifacts were collected. Most of the artifacts were pictures taken but other artifacts included breeding calendars and market bulletins. Initial data analysis began after the initial interviews were conducted and continued until data collection was complete. The data for each participant was coded and analyzed in a within-case study analysis as well as in a cross-case analysis. The results were discussed in detail in chapter four and the conclusions of this study were derived from the findings in that chapter.

This chapter provides discussion tied to the specific research questions, overall conclusions drawn from the study, limitations of the study, and implications for practice and future research.

Discussion

This study addressed the following two guiding research questions:

1. What were the perceptions of backyard rabbit growers in Mississippi? More specifically, this researcher wanted to understand the influences affecting growers' decision to raise rabbits and to utilize them as a protein source.

2. How were growers' practices, relative to rabbit rearing and consumption, affected by external variables outside of the growers' control?

The following discussion is organized by these two research questions.

Guiding Research Question One

What were the perceptions of backyard rabbit growers in Mississippi? More specifically, this researcher wanted to understand the influences affecting growers' decision to raise rabbits and to utilize them as a protein source.

Participants chose rabbits to raise a protein source to be more self-sufficient. Perceived relative advantages of raising meat rabbits include healthy (few disease issues), nutritious (low in fat/high in protein), quiet, prolific, easy, take up a small amount of time and space, efficient feed conversion, low cost, clean, and good for children. Getting started with rabbits is complex when looking for good stock and setting up your caging system. Though rabbits are prolific, breeding does pose challenges. The greatest adversity perceived by participants was the weather – predominantly the heat.

Self-sufficiency

Participants perceived raising meat rabbits as a way to be more self-sufficient, saying they do not know “where the world is going at this point and want to be self-sufficient.” The Merriam-Webster Dictionary defines self-sufficient farming as being able to maintain oneself without outside aid and being capable of providing for one’s own needs. According to the literature, subsistence farming is based on doing things naturally and is a part of self-sufficiency (Undlin, 2019; Vanorio, n.d.). Undlin (2019) and Vanorio (n.d.) continue their discussion of subsistence farming by saying it is not just a thing of the past, but also in looking toward the future for those wanting to live simply while providing for their own needs. Also in the literature, subsistence farming has advantages because the food raised is for the family’s consumption rather than for sale (Undlin, 2019; Vanorio, n.d.). This study found participants did feel empowered by their ability to raise food for their family but did take advantage of the opportunity to sell meat rabbits when asked. This study also observed that participants were going outside their realm of resources when feeding their meat rabbits. None of the rabbits raised in the study were fed solely on rations raised by participants.

The literature did note that subsistence agriculture can serve as a safety net for food security (Janvry & Sadoulet, 2011). Finzi (2002) also encouraged considering rabbits as an important contribution to assure food security while talking about their diffusion and antiquity providing proof of their sustainability when raised in backyards. This part of the study can also be supported by Janvry & Sadoulet (2011) in that the participants perceive raising meat rabbits as a safety net for food security, but refutes the participants claim that meat rabbits are raised for self- sufficiency (Undlin, 2019; Vanorio, n.d.).

This study lends support to further examining perceptions of raising protein sources like meat rabbits as food safety nets versus raising protein sources for self-sufficiency. It opens the door for educational opportunities to first educate individuals on the differences in raising food sources for subsistence farming versus raising food as a supplement, which provides security and peace of mind. Secondly, if individuals are interested in subsistence farming, educational support programs would be beneficial so food sources could be raised to feed the protein sources making the individuals free from the dependency on manufactured animal feeds.

Healthy and Nutritious

According to the literature, rabbit meat is rich in protein with high levels of essential amino acids, and it is low in fat with a favorable proportion of saturated, monosaturated, and polyunsaturated fatty acids. Rabbit provides a moderate amount of energy, which is mostly derived from meat protein. It is low in cholesterol and sodium. Additionally, it is a good source of potassium, phosphorus, selenium, and B vitamins, particularly being one of the richest sources of vitamin B12 (Cullere & Zotte, 2011, 2018). This study revealed that few participants were aware of these health benefits of rabbit meat consumption, supporting other reasons than health and nutrition for raising this protein source. Their perceptions revealed current trends in consumer choice geared more toward food safety with responses including “No Antibiotics Ever,” and “Free Range.” This discrepancy in perceptions of safe foods versus researched-based health information regarding a nutritious protein source, like rabbit meat, was interesting to the researcher revealing a need for more nutrition education to consumers.

Rabbit Production

Rabbits are a great choice of livestock for small farms because they are easy to raise; do not take up much space; are very quiet; can be prolific; and can provide meat, pelts, and fiber for your family (Robles, n.d.). This study supports this research with participants listing all of these as advantages to raising rabbits. Participants also included raising meat rabbits was good for children. Their children were not afraid of the rabbits because of their small size and timid nature and did not mind taking responsibility to care of them for these reasons. Hogs and cattle can be perceived as scary for children. Even chickens – especially roosters – can be aggressive. This was an emerging theme that was not found in the literature.

Participants also perceived that caging systems, breeding, and the weather are barriers to raising meat rabbits in backyards in Mississippi. These perceptions aligned with Finzi, (2002), which commented on barriers to the integration of rabbits to backyard systems and included defense against predators, building and maintaining equipment, proper genetics, best animal practices, and access to proper feeding.

Based on the literature (Finzi, 2002), the participants were asked specifically about predator issues. To date, none of the participants had perceived predators as a barrier to raising meat rabbits. This perception did not match the literature. The participants perceived their greatest adversity to be the weather – predominantly the summer heat. There was no emphasis on the weather as a barrier within the literature though most participants acknowledged others had warned them about keeping their rabbits cool. This could be that research regarding the backyard raising of rabbits was not conducted in the southern part of the United States where temperatures are warmer, especially during summer months. This finding is important as people in the South begin to adopt the practice of raising meat rabbits in backyards or if those who are already

raising rabbits are experiencing unexplained losses. It could be due to the heat and better management practices could be put into place. Andrew (2021) did comment on rabbit breeding saying rabbits do breed like rabbits but when done so on an intensive or commercial scale, the rabbits usually die from disease. None of the participants are operating on this level.

Guiding Research Question Two

How were growers' practices, relative to rabbit rearing and consumption, affected by external variables outside of the growers' control?

The interaction effect was included in this research to provide the researcher with a better representation and understanding of the relationship between raising backyard meat rabbits before, during, and after the COVID-19 pandemic. The omission of the interaction effect could result in a misrepresentation of the results since the pandemic was occurring during this study.

According to the literature, rabbits were raised by thousands of Americans in their backyards during World War II. Rationing was in effect and prime meats, like beef, were not always available. With the 1960s came the rise of the middle class, the feminist movement, and the thought that all families needed a pet (Thompson, n.d.). Even though rabbit consumption spiked during World War II, it all but disappeared afterward (Carter, 2014).

Participants noted that the pandemic did affect their perceptions of raising meat rabbits. Participants were faced with the realization that they could not just run to the store for food so concentrated more on raising their own. Bumping up production allowed them the opportunity to help others raise meat rabbits in their own backyards. Similar to the literature by Carter (2014), though rabbit numbers increased with several participants in the study, now they are beginning to adjust back down. This new insight regarding rabbit production during the COVID-19 pandemic is not found yet in the literature. Research findings regarding the impact of a pandemic like

COVID-19 on food raising practices could be beneficial for sustainability in any crisis. If raising rabbits can help meet our nutrition needs during a war or a pandemic, it might be practical in other situations where food availability might be threatened.

Need for Integration of Programs

According to the Center for Disease Control (2020), obesity rates are on the rise globally. The state of Mississippi leads the nation in obesity. The literature tells us that food-based approaches have a strong potential for meeting the challenge of reducing or eliminating micronutrient malnutrition. Key challenges include making the elimination of micronutrient deficiencies more community driven with support for appropriate food behavior change (Tontisirin, et al., 2002). Meat rabbit consumption aids a varied and balanced diet and is easy to raise in urban backyards, but its consumption falls behind other protein sources like beef, pork, and chicken (Petrescu & Petrescu-Mag, 2018). By understanding demographics and perceptions of backyard rabbit meat growers, meat rabbit programs could be tailored to better suit communities leading to their support and to their adoption of local backyard rabbit programs.

Rabbit meat consumers are more likely to be men over 36 years old with an income below \$50,000 (Beale et al., 2004). Looking at the demographics of this study, four out of five participants were men and four out of five participants placed themselves in the middle-income class. Education did not seem to have any impact in this study on participants who chose to raise meat rabbits in their backyard. Two of the five participants did not have any years at the college level while three had at least some college education. Interestingly, all five participants were over the age of 44 and three of the five participants have retired from their first careers.

By looking at the data and comparing it to current trends found in the literature, consumers are demanding leaner carcasses with lower fat content and high protein quality

(Hernandez & Gondret, 2006). McLean-Meyinsse et al. (1994) also noted that freshness, taste, and juiciness of the meat were highly regarded attributes that influence consumption choices. According to the data collected in this study, rabbit meat was perceived to be healthy not because it is low in fat and high in protein but because meat rabbits do not require vaccines, receive no growth hormones, and are relatively disease free so receive no antibiotics. Participants also reacted positively to following their food during from feeding to processing knowing it was clean and humane. By incorporating community members' perceptions of raising meat rabbits in Mississippi backyards, programs can be tailored to reflect cultural biases and regional differences while at the same time incorporating science-based nutrition information. The findings here will add clarification to existing literature.

Conclusions

The current study compiled multiple data sources to provide answers to the two guiding research questions of this study:

1. What were the perceptions of backyard rabbit growers in Mississippi? More specifically, this researcher wanted to understand the influences affecting growers' decision to raise rabbits and to utilize them as a protein source.

2. How were growers' practices, relative to rabbit rearing and consumption, affected by external variables outside of the growers' control?

These two guiding research questions were designed to address the study's problem statement, which focused on the need for integrated food-based programs sought to help with malnutrition. The two research questions of this study effectively addressed the problem statement, and the conclusions contribute to the literature. Chapter Four provided data results with a discussion of those here in Chapter Five.

Participants perceived raising a protein source like meat rabbits in their backyards provided them with an opportunity to be self-sufficient. Though none of the participants were self-sufficient at the time of the study, they were raising meat rabbits to increase their food security. Rabbits were suitable for them because they were easy to raise; do not take up much space; are very quiet; can be prolific; and can provide meat, pelts, and fiber for their family. External variables, like a pandemic, can impact the practices of backyard meat rabbit growers increasing production when a greater need is perceived and decreasing production also based on perceived need. Challenges were perceived but actions were taken to persevere these complexities.

Using qualitative methods to answer research questions made a unique contribution to the findings of this study. It allowed the opportunity to gain valuable new insights not found in the literature while confirming the empirical studies that have already been done.

Limitations

Limitations of this study include its small purposive sample of five adults in the state of Mississippi. Although diversity of participants included different ages, sexes, and races, other attributes like culture, region, the local food systems, and socioeconomic status may have influenced their perceptions of raising meat rabbits in their backyards (Resurreccion, 2004). There is also the possibility that some participants may not recall important aspects of raising, processing, or consuming meat rabbits or that participants will only reveal what is perceived to be socially desirable (He et al., 2014). Because qualitative research is open-ended, participants have more control over the content of data collected. The results will be based on opinion and judgment rather than results.

Implications

Previous studies documented the nutritional rationale for raising meat rabbits for a protein source as well as provided logistical support for meat rabbit sustainability when raised in urban backyards. The results of this study revealed that participants perceptions were that they were raising meat rabbits for self-sufficiency, but their methods did not fit the definition of self-sufficiency. Participants perceptions on raising meat rabbits in their backyards did align with previous literature regarding advantages and barriers. Interesting also to the researcher was the demographical information found from the study. Though the sample size was small, it aligned with previous literature but also added to the literature. The Interaction Effect, though not found specifically in the literature as it relates to the COVID-19 pandemic, did align with the conditions present because of World War II.

The results of this research study offered other interesting findings outside the literature. These provide implications for future research. The first implication is that of Rogers' (2003) social systems, communication channels, and change agents as it pertains to the adoption of raising meat rabbits in rural backyards. In a study like this, friends and family, social media like Facebook and YouTube, and farm businesses like Tractor Supply and the local county CoOp should be explored noting their roles played in the adoption process. Observability within the Persuasion Stage could be compared and/or contrasted with social systems, communications channels, and change agents. Trust of these sources would be important to include.

A second implication for further study would be to compare backyard grower-consumer perceptions of raising chickens with rabbits – both for consumption. It seemed to the researcher that most – 80% -- of the participants raised chickens then added rabbits in an effort to diversify their protein sources for self-sufficiency rather than choosing rabbits for their renowned

nutritional status. Additionally, the researcher could explore the backyard grower-consumers desire for protein only. Could it be cultural and viewed as more valuable as mentioned by participants when speaking of a barter system?

A third implication for research is that participants noted they raised rabbits to be more self-sufficient. Self-sufficiency would be an excellent topic to dive deeper into and look at similarities and differences in practices raising rabbits for self-sufficiency versus raising rabbits for a hobby. This researcher asked this question but was not able to explore it fully. Also, compare raising protein for food, money, or bartering could provide interesting insights.

A fourth implication for a research opportunity would be to explore participant's perceptions of raising backyard rabbits as a privilege. This was mentioned at least three times in this study. When this researcher visited Guatemala on a study abroad, a lot of pets were owned by the people there, but they were very malnourished. When this researcher visited Uganda, she observed the absence of pets. When she asked the locals, she was told they had to feed themselves rather than pets. These experiences coupled with the literature explaining the rise of the middle class in America and along with it the rise of luxury items like eating more beef and owning more pets sparked an interest in the perception that raising animals for food is a privilege rather than as a necessity. This could loop back to our culture and the belief that raising protein sources is superior or more valuable than raising fruits and vegetables.

Finally, a fifth implication that relates back to self-sufficiency, if indeed rabbits are raised in rural backyards in Mississippi for self-sufficiency, is why are the pelts – a byproduct of the rabbit – not saved? This question lends support to the research opportunity that raising rabbits for self-sufficiency may really be an excuse for a hobby or perhaps “insurance” in case the participants really do need to depend on themselves. Ultimately, backyard grower-consumers

could be motivated by the intrinsic rewards mentioned in this study and not for self-sufficiency.

Further exploration would better understand participants mindsets rather than their perceptions of the situation.

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APPENDIX A
INTERVIEW DATA COLLECTION PROTOCOL

Preparation Steps for Interviews

1. Obtain written permission to conduct single case study.
2. Obtain approval from Internal Review Board (IRB).
3. Prepare permission letter(s) requesting prospective participant's (') participation in the study.
4. Email introduction and permission letter(s) officially requesting participation.
5. Personal meeting (may be virtual) as a follow-up to the permission letter(s) to address questions, to provide additional details, and to develop rapport with potential participants.
6. Establish interview schedule (one semi structured 60-90 minutes session) – location and time with participant(s).
7. Review interview questions with dissertation chair to ensure they are open-ended and address each research question. Adjust interview questions as needed.
8. Schedule case study participant(s) interview.
9. Prepare interview tools (forms, interview matrix, recording device, map to location or virtual meeting link).

Steps for Conducting the Interviews

1. Arrive at the interview site 10 minutes prior to scheduled time to prepare interview materials.
2. Greet and allow participant to become comfortable and to explain the interview process (recording and note taking) and answer any questions participants may have.
3. Obtain verbal and written consent to proceed with the interview.
4. Confirm participant's name, interview date, location, time, and reason for the interview.
5. Start interview questions and probes. Allow responses for subsequent questions that may emerge from interview questions.
6. Inform participant when approximately 5 minutes remain in the interview session.
7. Conclude interview, thank participant, and address post interview questions from participants. Remind participant that they will have an opportunity to review the transcripts for accuracy (member check) and make changes prior to the reporting of the findings.

Steps for Interview Follow-up

1. Transcribe the interview as soon as possible and save on a password protected laptop.
2. Secure written responses and tape recordings in locked file accessible only by researcher.
3. Email participant when transcript is ready for review (trustworthiness-member check).
4. Commence 8-step qualitative data analysis procedures.
5. Identify themes that emerge.
6. Provide participant with additional opportunity to review findings that emerged.

Interview Introduction Narrative

Hello. My name is Millie Murphree, and I am a graduate student at Mississippi State University working on my dissertation under Dr. Kirk Swortzel. A written dissertation is one requirement for my degree. For my dissertation, I am exploring consumers' perceptions of rabbit consumption. Because you have knowledge of the research topic, I invited you to participate in one 60-90-minute semi-structured interview and one 30-minute semi-structured follow up interview to be conducted [face-to-face, virtually]. During the interview, you will be asked to respond to a set of questions on the research topic. I am also asking to conduct one 60-minute observation separate from the interviews and to collect any relevant artifacts.

Please know that participation in the interview, observations, and the collection of artifacts is voluntary; risks are minimal; a pseudonym will be used for your name; and you are free to discontinue the interview at any point after it has started.

Do you have any questions regarding the interview? [**Answer any questions that participant asks.**]

Are you ready to begin? [**Wait for a response.**]

First, we will review the informed consent document. Please read the document silently as I read it aloud. [**Read the document and wait for participant to sign.**]

Thank you. Now, we will begin the interview.

[Don't forget to press RECORD!]

Mississippi State University
Informed Consent Form for Participation Qualitative Data Collection
Interview

Title: Backyard Grower-Consumer Perceptions of Rabbit Consumption in Rural Mississippi

Topic: Growing, Raising, and Consuming Meat Rabbits

Researchers: Millie Murphree

Background

I am asking you to take part in an interview. ***Your participation is voluntary.*** Before you decide to participate in this interview, it is important that you understand why the interview is being conducted and what it will involve. This form is designed to give you the information about the study so you can decide whether to continue with the interview. Please take the time to read the following information carefully. Please ask for clarity, if needed. When all your questions have been answered, you can sign the document if you agree to be interviewed. This process is called “informed consent.” A copy of this form will be given to you.

Purpose of the Interview

The purpose of the proposed study is to explore backyard grower-consumers’ perceptions of rabbit consumption. The information gathered from this research may be used later to diffuse the innovation of backyard grower-consumer rabbit production in the state of Mississippi, in other states within the United States, or in other countries.

Study Procedures

You are invited to participate voluntarily in this interview. If you decide to participate, you will be asked to do the following:

- Read and sign an informed consent. (5 minutes)
- Participate in an interview (60-90 minutes)

The interview will be conducted [in person or virtually] and will be audio-recorded. ***You have the option of requesting I stop the recording at any time.***

Risks and discomforts

There are no foreseeable risks to participation in this study. [*Here, if conducting the interview in person, please add information on COVID-19 precautions if applicable.]

Benefits

While you may not directly benefit from participating in the study, it is possible your participation might increase your awareness of [...].

Incentives for participation

There are no incentives for participation.

Audio/Video Recording

All interviews will be audio-recorded. *You have the option of requesting I stop the recording at any time.*

Privacy/Confidentiality

The information/data obtained during this interview, which could identify you will be held strictly confidential, except where prohibited by law (i.e., reporting cases of harm to self or others or intent to do so). During the interview, you will be referred to using a pseudonym.

All raw data will be kept [...] until May 2022. At that time, all copies of the printed data and transcripts will be shred and all audio-recordings will be deleted and scrubbed.

Taking part is voluntary

Participation in this interview is voluntary. You may choose not to participate or to stop at any time.

If you have questions

If you have questions about the informed consent or research procedures, Dr. Kirk Swortzel serves as my advisor and will respond to any questions. He can be reached via email at KSwortzel@humansci.msstate.edu or via phone at 662-325-7837.

You also may contact me at mma350@msstate.edu or (205)723-9631.

Because this interview is for a course, Institutional Review Board approval is not required. For more information on the MSU Research Compliance Office please see the website

<http://orc.msstate.edu/humansubjects/participant/>.

Please keep this copy of the informed consent for your records. Please sign the following page and return with the survey instruments.

Informed Consent Signature Page

Research Subject's Consent to Participate in Research:

To voluntarily agree to take part in this interview, you must sign on the line below. Your signature below indicates that you have read or had read to you this entire consent form and have had all your questions answered.

Please take all the time you need to read through this document and decide whether you would like to participate in this research study. You will be given a copy of this form for your records.

Name, Interviewee

Signature

Date

Name, Interviewer

Signature

Date

Archival Information Sheet

Title of Research Project: _____ **Archival #:** _____

Number of people interviewed/observed: _____ **Location (City/State):** _____

Ethnicity: _____ **Gender:** _____ **Approximate Age:** _____

| Data Type (Circle) | Interview | Observation |
|---------------------------------------|----------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Type of Participant or Setting | <input type="checkbox"/> Virtual <input type="checkbox"/> Home/Farm <input type="checkbox"/> Other _____ | <input type="checkbox"/> Virtual <input type="checkbox"/> Home/Farm <input type="checkbox"/> Other _____ |

Additional/backup

Method of Recording Data (Mark all that apply)

location(s) of data:

| | | |
|-----------------------------------------|--|--|
| Audiotape/Recording | | |
| Field Notes | | |
| Interview Guide Notes | | |
| Focus Group Note-Taker Notes | | |
| Focus Group Guide Notes | | |
| Expanded Field Notes | | |
| Transcription | | |
| Translation | | |
| Electronic, Translated Transcription | | |

Person who collected data/date: _____

Person who transcribed data/date: _____

Person who translated data/date: _____

Person who typed data/date: _____

APPENDIX B

SEMI STRUCTURED INTERVIEW PROTOCOL—OPEN-ENDED QUESTIONS

Semi Structured Interview Protocol – Open-ended Questions

Perceptions of Rabbit Consumption

Date _____ Time & Place of Interview _____

Interviewer _____ Interviewee _____

Other _____

Pre-Interview Information and Procedures

- I. Introductions (Researcher introduces herself, reviews process for session, tells approximately how long interview will last, and describes general format for questions.)
- II. Study purpose and applications (Researcher reviews study's purpose and uses of the finding including how the findings will be reported and shared.)
- III. Consent forms, approvals (Informed consent forms distributed to participants, signatures secured, assurance of privacy/confidentiality/anonymity as appropriate, protection of the participant assurances reviewed, questions answered, note that the interview will be recorded and obtain permission for that, as well.)
- IV. Treatment of data (Researcher indicates how data will be managed, secured, and disposed of after a specific time.)
- V. Other questions or concerns (Other issues are discussed prior to beginning the interview session.)

Opening the Interview Session

Q1: How long have you been raising rabbits? (Rogers' DOI)

Q2: What type of meat rabbits do you raise?(Rogers' DOI)

Q3: How many rabbits do you have? (Rogers' DOI)

Q4: What is your purpose for raising meat rabbits? (Azjen's TBP, Giddens' Structuration Theory – intention))

Key Interview Questions

MRQ: What are backyard grower-consumers' perceptions of rabbit consumption?

GRQ1: How do backyard grower-consumers perceive the raising, handling, and processing of rabbits that are intended for consumption?

1. Can you tell me about the rabbits you raise? [Type, housing, community caging or individual] (Rogers' DOI)
2. What experiences did you have with rabbits before now? (Rogers' DOI – Compatibility and Trialability)
3. Tell me about your motivation for raising rabbits. (Rogers' DOI, Azjen's, Gidden's, Interaction)
4. How did the COVID 19 pandemic affect your production/consumption of rabbit meat? (Interaction Effect)
5. Can you talk about the challenges associated with raising rabbits? (Rogers' DOI – Complexity) [Any social acceptance issues? Azjen and Gidden's]
6. What costs do you have associated with raising, processing, and consuming rabbits? (Rogers' Relative Advantage or Complexity; Rising Costs due to Pandemic? Interaction)
7. How do the costs of raising, processing, and consuming meat rabbits compare to the costs of other protein sources? (Rogers' Relative Advantage)
8. Talk to me about your breeding/rearing protocol? [Record keeping, breed at certain times, goals, etc.] (Rogers' DOI – sustained adoption; Intention for sustained food source? Azjen and Giddens)
9. Walk me through your processing method. (Rogers' DOI – Complexity)
10. Tell me about the reactions from others when they hear you raise and consume rabbits. [Classify these individuals as important/close to participant or mere acquaintances.] (Rogers' DOI – Communication Channels; Structure – Azjen and Giddens)

GRQ2: How do backyard grower-consumers perceive the preparation and the cooking methods of rabbits for consumption?

1. Tell me about the preparation and the cooking methods associated with rabbit consumption. (Rogers' Complexity)
2. What are your favorite recipes/meals? [Include side dishes] (Rogers' DOI – Observability)
3. Can you tell me about the nutritional value of rabbit meat? (Rogers' DOI – Relative Advantage)
4. How do you view rabbit meat compared to other protein sources? (Rogers' DOI – Relative Advantage)
- 5.

Concluding the Interview

Concluding Question:

1. Walk me through any changes in your rabbit program from the time you started until now and tell me what caused these changes. (Interaction Effect)
2. Do you belong to any meat rabbit groups or clubs? (Rogers' DOI – Social Systems/ Communication Channels)
3. Who is your county Extension Agent? (Rogers' DOI – Social Systems/ Communication Channels)
4. Is there anything else you would like to tell me or share with me?

Demographic Information

1. Address _____
2. Where do you buy groceries? (Food desert or food swamp?) _____
3. Where do you buy feed for meat rabbits? (Relative advantage) _____
4. How many times a week do you eat out and where? (Validity) _____
5. Phone number _____
6. Age _____
7. Gender _____
8. Educational Level _____
9. Current Occupation _____
10. Socio-economic Status _____
11. How did you learn about raising rabbits? _____
12. Laggard versus Innovator _____

Thank you and Follow-Up Reminder

Thank you for your time and for your insights on raising, processing, and consuming rabbits. I will follow up with you in a few days to verify my notes, ask any clarifying questions, and see if you thought of anything else to add.

Interviewer Note-Taking Recording Sheet Matrix

Interviewer Name: _____ **Interviewee Name:** _____

Date: _____ **Location:** _____

Start Time: _____ **End Time:** _____

| Interviewer Notes/Observations/Reactions | Nonverbal Cues | Quotable Quotes |
|-----------------------------------------------------|-----------------------|------------------------|
| | | |

| | | |
|--|--|--|
| | | |
|--|--|--|

APPENDIX C
OBSERVATIONAL PROTOCOL MATRIX

Interviewer Name: _____ **Interviewee Name:** _____

Date: _____ **Location:** _____

Start Time: _____ **End Time:** _____

| Observational Descriptions | Notes/Reflections |
|-----------------------------------|--------------------------|
| | |

| | |
|--|--|
| | |
|--|--|

APPENDIX D

DATA COLLECTION AND DATA ANALYSIS MATRIX

| RESEARCH QUESTIONS | DATA COLLECTION SOURCES | DATA COLLECTION ANALYSIS |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Guiding RQ1: What are the perceptions of backyard rabbit growers in Mississippi? More specifically, this researcher wanted to understand the influences affecting growers' decision to raise rabbits and to utilize them as a protein source.</p> | <p>Semi Structured Interviews and Observations (Site Map, Equipment, Breed(s), Feed, Feeding and Watering Systems, Schedules/Calendar reflecting Breeding, Grow Out, Processing, Participant's Demeanor and Word Choices While Handling)</p> | <ul style="list-style-type: none"> • 8-Step Qualitative Data Analysis • NVivo 12 • Epoché/Bracketing Journaling/Audit Trail • Member Check • Rich, Thick Descriptions • Reliability and External Audits |
| <p>Guiding RQ2: 2. How are growers' practices, relative to rabbit rearing and consumption, affected by external variables outside of the growers' control?</p> | <p>Semi Structured Interviews and Observations (Site Map, Equipment, Processes, Participant's Demeanor and Word Choices)</p> | <ul style="list-style-type: none"> • 8-Step Qualitative Data Analysis • NVivo 12 • Epoché/Bracketing Journaling/Audit Trail • Member Check • Rich, Thick Descriptions • Reliability and External Audits |

APPENDIX E
LETTER TO PANEL OF EXPERTS

Dear Mrs. Graves,

I am currently developing my interview protocol for my graduate research dissertation. My dissertation topic is backyard grower-consumer perceptions of rabbit meat consumption. I know that you raise rabbits and have experience working with others in the raising, processing, and consumption of meat rabbits. Additionally, you have research and interview experience. I am writing to you in hopes that you will serve on my panel of experts to review my interview protocol.

I have attached my interview protocol. I would like for you to read the protocol including the questions from a participant's perspective. Please comment specifically about the appropriateness of language and clarity as well as the efforts noted to achieve trustworthiness from my participants. I am using Rogers' Diffusion of Innovations Theory and would like for you to offer comments regarding my linkage of theory constructs to interview questions. Any other comments would be valued and appreciated.

My timeline for interviews starts with participant one on October 13, 2021. I would appreciate your feedback by October 10, 2021 so that I can compile comments from the entire panel and make the necessary edits. Please know that I realize you are busy. I have tried to streamline the protocol in hopes that your review will take no longer than 30 minutes. I greatly appreciate your help toward my research project.

Thank you,

Millie Murphree

APPENDIX F

SEMI STRUCTURED INTERVIEW PROTOCOL 2—OPEN-ENDED QUESTIONS

Perceptions of Rabbit Consumption

Date _____ Time & Place of Interview _____

Interviewer _____ Interviewee _____

Other _____

Rogers Theory of Diffusion of Innovation: The process in which an innovation is communicated through certain channels over time among members of a social system. Four key components are innovation, communication channels, time, and social system.

Interaction Effect: Pandemic Affects

| Questions | Link to Theory |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| 1. During interview one, we said raising rabbits and eating them is healthy. Can you tell me in your own words what healthy means to you? (most have no idea about the nutrition of rabbit meat) | Knowledge Relative Advantage |
| 2. You also talked about raising rabbits to be self-sufficient. Can you walk me through your thinking process about being self-sufficient including where you are in the process of being self-sufficient and what your future goals are? Do you have a timeline for reaching that goal? | Time Relative Advantage |
| 3. What advantages are there to raising protein sources when compared to raising a vegetable garden? Do you have a vegetable garden? What do you raise and why? Do you can/freeze/preserve vegetable also? | Relative Advantage compatibility Complexity |
| 4. What makes raising rabbits about self-sufficiency different than raising rabbits for a hobby or for financial gain? | Relative Advantage |

| | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|
| <p>5. Can you explain how it makes you feel to provide someone with a rabbit you've raised whether that rabbit is for a pet or for food? (intrinsic rewards?)</p> | <p>Relative Advantage</p> |
| <p>6. If your first rabbits were given to you, what role did this play in your desire to accept them and to take on the responsibility for raising them? If you were to pass that along to someone else – giving a breeding pair, what would be factors about that person to consider or to influence your decision? Also, would you try to take any animal offered to you for free? What is it about rabbits that caused you to accept them?</p> | <p>Communication Channel Triability Social System</p> |
| <p>7. Can you talk about increasing rabbit production numbers? Is it in an effort to increase your personal food security, to have rabbits to sell or to donate to help others with food security issues, to help cover feed costs?</p> | <p>Interaction Effect Relative Advantage Triability</p> |
| <p>8. How does the way a meat rabbit looks impact your production or consumption of that rabbit? (Some people want to keep kits they regard as beautiful. Does their perception of the way the rabbit looks impact their desire to consume that rabbit?)</p> | <p>General Perceptions</p> |
| <p>9. I asked you to keep a calendar to show how much time you spend raising your rabbits? How did you feel about the accuracy of this measurement?</p> | <p>Time</p> |
| <p>10. There are a lot of usable products from the rabbit: the meat, manure, organs, and pelts but no one seems to be harvesting the pelts. What are your thoughts regarding this? What would make taking the time</p> | <p>Time Relative Advantages</p> |

| | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| <p>to learn and harvest pelts worth it to you?</p> <p>11. So many are turning to the Internet to connect with others raising rabbits. How do you decide which sources to trust? What is your preference for information?</p> <p>12. What knowledge or information would you like to have but still don't have? (Record keeping, marketing, recipes, pelt uses)</p> | <p>Communication Channels Social Systems</p> <p>Knowledge</p> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------|