# Artificial Intelligence as an Agricultural Communicator: A Content Analysis of Generative AI Responses

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## Introduction

The rapid adoption of generative artificial intelligence (AI) has fundamentally changed how individuals seek and consume information. Recent reports indicate that many college students and a growing segment of the public regularly use tools such as ChatGPT, Gemini, and Claude to answer questions, summarize complex topics, and learn unfamiliar concepts (Mulford, 2025). As these technologies increasingly serve as information intermediaries, they also become influential communicators capable of shaping public understanding of scientific and agricultural issues (Bingaman & Tellesen, 2025).

This shift is particularly important within agriculture, where public knowledge is often limited and misconceptions surrounding modern production practices remain common (Clark et al., 2016). Agricultural communicators have long emphasized the need for accurate, transparent, and accessible communication to bridge the gap between producers and consumers (Shank et al., 2025). If generative AI becomes a primary source of agricultural information, the quality and framing of its responses may influence public perceptions of agriculture, before individuals encounter information from agricultural professionals. Accordingly, this study explored how leading generative AI models communicate agricultural concepts by examining the themes, portrayals, accuracy, completeness, and variation in responses to standardized agricultural prompts.

## Conceptual Framework

This study is informed by framing theory, which suggests that communicators influence how audiences interpret issues by emphasizing certain aspects of a topic while omitting others (Entman, 1991). Although generative AI does not intentionally frame messages, its responses inherently prioritize particular themes, terminology, and perspectives that may influence how agriculture is understood by public audiences. To guide evaluation of these responses, this study also draws upon the Chatbot Evaluation Framework (Kamra et al., 2025), specifically the AI model assessment dimension, to examine the accuracy, completeness, readability, tone, and framing of AI-generated agricultural content.

## Methods/Procedures

A qualitative content analysis (Tisdell et al., 2025) was conducted using responses generated from ChatGPT, Gemini, and Claude. Fifteen standardized prompts addressing common agricultural topics were developed to reflect questions a member of the general public might ask (e.g. beef production, animal welfare, pesticides, food systems, and FFA). Each prompt instructed the platform to produce approximately 250 words intended for a general audience. Responses were collected during the same time period to minimize variation resulting from platform updates. Responses were copied into a document for coding, comparison, and thematic analysis (Braun & Clarke, 2006). Additionally, to increase trustworthiness, we used peer debriefing and reflexive journaling (Tisdell et al., 2025).

## Findings

Across the 15 standardized agricultural prompts, ChatGPT, Gemini, and Claude consistently generated responses that were factually accurate and appropriate for public audiences. However, notable differences emerged in the themes emphasized, portrayals or agriculture, completeness of information, and overall communication style. Sustainability, animal welfare, and food systems were the most prevalent themes across all three platforms,

although each emphasized these concepts differently. ChatGPT consistently framed agriculture as science-based, regulated, and efficient, describing beef production as a system that "helps provide consumers with a reliable supply of safe, nutritious, and affordable beef products" while emphasizing that producers, "balance animal care, environmental stewardship, and efficient food production." Gemini more frequently adopted a consumer-oriented perspective, portraying farm-to-table systems as a way to "keep more money within the community, directly supporting local farmers" and emphasizing environmental sustainability through local food systems. In contrast, Claude consistently presented agriculture as a complex system of competing priorities, describing sustainable agriculture as meeting today's needs "without compromising the ability of future generations to feed themselves" while acknowledging environmental and societal trade-offs.

Although responses were generally accurate, completeness varied among platforms. ChatGPT routinely omitted controversial topics, such as debates surrounding feedlots, pesticides, or animal welfare, resulting in highly industry positive explanations. Gemini acknowledged consumer expectations and sustainability concerns but occasionally oversimplified conventional agriculture, including descriptions of food bypassing "massive corporate packaging plants" in favor of local systems. Claude provided the most comprehensive responses by incorporating multiple perspectives and discussing environmental, ethical, and economic considerations, though some production realities remained absent depending on the topic.

Clear stylistic variation was also evident across the varied platforms. ChatGPT generated structured, textbook-like explanations, Gemini adopted a conversational and narrative style designed for consumers, and Claude produced the most detailed and analytical responses. Despite responding to identical prompts, each model constructed a distinct representation of modern agriculture, demonstrating meaningful variation in how agricultural concepts are communicated.

## Conclusions/ Discussion/ Implications

As generative AI becomes an increasingly common source of public information, these findings suggest that large language models are emerging as potentially influential agricultural communicators capable of shaping public understanding of modern agriculture. Consistent with framing theory, each platform emphasized different aspects of agricultural systems despite receiving identical prompts, demonstrating that AI-generated content reflects distinct message frames rather than purely objective representation (Entman, 1991). Likewise, the findings reinforce that value of evaluating AI-generated communications beyond factual accuracy by considering completeness, tone, and framing, as proposed by the Chatbot Evaluation Framework (Kamra et al., 2025).

These findings align with previous agricultural AI evaluation research, which similarly found that leading generative AI platforms generally provide accurate agricultural information (McCord & Landaverde, 2026), while differing in response detail, language, and presentation, highlighting the importance of expert oversight when AI is used as an educational or communication tool. For agricultural communicators, educators, Extension professional, and commodity organizations, these findings highlight the need to proactively engage with AI as an emerging communication channel rather than viewing it solely as a technology tool. Future research should examine how AI-generated messages influence public trust, knowledge, and perception of agriculture as large language models continue to evolve.

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