Advancements in Agricultural Development
Volume 4, Issue 2, 2023
agdevresearch.org

Marvelous metrics: A quantitative content analysis to establish social media benchmarks for Florida fruit and vegetable farms on Facebook

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Abstract

Social media platforms like Facebook offer farms a chance to reach larger audiences and gain connections through online engagement. Previous work demonstrates that online engagement can lead to increased sales. However, much work in tracking benchmarks for social media metrics has been outside of an agricultural context. This study aimed to benchmark the presence of fruit and vegetable farms on social media and the associated metrics (followers, likes, engagement rates, reactions, shares, etc.) to offer a standard of comparison for farms on social media. A quantitative content analysis was used to collect data from 117 farms for general analysis, and a sub-sample of 15 farms was used for a deeper analysis of 1,111 Facebook posts. Results indicate Facebook is the most used platform by Florida fruit and vegetable farms, and photos are the most used post type. Farms with the highest engagement rates posted less than farms with the lowest engagement rate, which indicates that posting more frequently may not increase engagement rates. Implications from this work are that farms may be unique in the social media space and may not need to post during the seasons when they do not have crops available for purchase.

Article History

Received: January 25, 2023
Accepted: May 23, 2023
Published: June 16, 2023

Keywords

social media strategy; quantitative content analysis; Facebook; engagement rate; Florida farmers; communications professionals

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Introduction and Problem Statement

The majority of Americans are a minimum of three generations removed from the farm (Vilsack, 2014), but platforms like Facebook can offer opportunities for producers to reach larger audiences and gain near-instantaneous responses through various online engagement methods (Reese et al., 2001). Social media has continually increased in recent years and likely will continue to increase worldwide (Mason et al., 2021). Research shows a significant relationship between social media and purchasing behavior (Shah et al., 2019), which makes it a potentially valuable endeavor for agricultural producers. The potential for sales through social media in Florida is great, with various fruits and vegetables available year-round due to various growing seasons (Florida Department of Agriculture and Consumer Services [FDACS], 2021). When the COVID-19 pandemic began, it created barriers for producers and forced innovative ideas and collaborations to market produce online effectively. Other industries have data-driven best practices to compare the social media performance of businesses with (Dascau, 2022; Facebook IQ, 2016); however, due to the cyclical nature of the agricultural industry, benchmarks and practices for other industries may not be comparable or applicable to agricultural producers on Facebook.

Engagement rate is one of the most recommended metrics to measure (Dascau, 2022; Facebook IQ, 2016) and is considered the currency of social media marketing (Sehl & Tien, 2023). Engagement rate is calculated using the formula (likes + reactions + comments + shares)/followers (Stebner et al., 2017). The average engagement rate across all accounts on Facebook as of January 2023 was 0.07 (Statista, 2023). Social media marketing experts define a good engagement rate as anything between .01 and .05 (Sehl & Tien, 2023). However, it is yet to be determined if these benchmarks and practices established by other businesses apply to agricultural producers. Other studies have examined social media engagement with agricultural businesses through the lens of post types in informational campaigns (McLeod-Morin et al., 2020) and characteristics of posts (Bowman et al., 2020). This study looks explicitly to fill the literature gap in best practices for Florida fruit and vegetable farms and the post frequency, post type, and engagement rate.

Theoretical and Conceptual Framework

A study by Hays et al. (2013) sought to understand how prevalent social media marketing was among marketing organizations of tourist destinations. This study found many of the organizations were not effectively using social media to interact with consumers; social media was not widely recognized as a critical marketing tool in marketing plans resulting in underfunding; and social media strategies could increase outreach through creative and tailored content (Hays et al., 2013). Industries seeking to market products should recognize the benefits of utilizing social media as a key marketing tool. This can be applied both with individuals and organizations or in this case, farms (Shah et al., 2019).

Consumers use social media and other online platforms to seek information; search engines and social media are the top two of the most used online services (De Choudhury et al., 2014).

Research recommends that agricultural communicators use social media, including Facebook, for agricultural issue-related communication with the public and to promote social movements (Graybill-Leonard et al., 2011). Florida fruit and vegetable farms are provided an opportunity to connect with consumers through social media, promote their products, and provide farm updates. Facebook was first launched in 2004 (Maryville University, n.d.) and has proliferated, with over 2.96 billion active users as of the fourth quarter of 2022 (Statista, 2023). Since its initial launch, Facebook has experienced several updates, and new tools have become available for users, like the like button, born in 2009 (Kincaid, 2009). Not only does the like button provide a user's affirmation of a post, but it also may push the content they indicated they liked to the newsfeed of those who are friends with them on the social media network (Mangalindan, 2015). While simple, the like button left Facebook users wanting more (Kapoor et al., 2018). Thus, on February 24, 2016, reactions became available to Facebook users allowing users to show different reactions to a post (Newton, 2016). In April 2020, amidst the onset of the COVID-19 pandemic, the care reaction was included in the list of available reactions (Lunden, 2020). Although Facebook's algorithm is ever-changing, users see more of the content they click like on most and less of the content they continually scroll past. With this, engagement is an important metric that provides insight into an organization's posts (Constine, 2016).

Before social media, communication channels had limited opportunities to quickly reach a specific audience of interest (Owen & Humphrey, 2009); often, it was unclear if the message reached the intended target audience. Platforms, including Facebook, automatically capture a variety of analytics that provide insight into post-performance and engagement. Examples of engagement include liking, commenting, or sharing a post; however, on Facebook, engagement is any action on a specific page or post (McLachlan & Newberry, 2021). Research from Statista (2023) indicated that the average Facebook engagement rate for the third quarter of 2022 was 0.07. While the engagement rate numbers do not appear bold, being attentive to engagement rates is essential in a successful social media strategy. Kite et al. (2016) identifies the need to invest resources into managing Facebook for quality content and the success of the posts.

Evidence exists linking Facebook engagement with sales (Goh et al., 2013). Analyzing Facebook engagement rates allows organizations to identify what posts perform best among the intended audience. While social media provides the previously mentioned opportunities, it is still not considered a vital component of all marketing strategies, resulting in neglect of the platforms and underfunding to effectively carry out social media responsibilities (Hays et al., 2013). The data analytics provide can be a resource to indicate the importance of utilizing Facebook, specifically in this study, in fruit and vegetable operations.

Purpose

This quantitative content analysis aimed to determine the presence of Florida fruit and vegetable producers on social media and determine the relationship between types of Facebook posts and the engagement rate by collecting relevant analytic data. The following four research objectives guided this study:

1. Determine the presence of Florida fruit and vegetable producers on social media.
2. Describe Facebook activity by Florida fruit and vegetable producers.
3. Determine the types of Facebook posts used by Florida fruit and vegetable producers.
4. Define Farm Engagement Rate Levels by Strategy.

Methods

Quantitative research is utilized to aid researchers in interpreting the relationships between different variables (Field, 2000), which can allow results to be generalized to a larger population. Specifically, a quantitative content analysis analyzes the relationships between values assigned to types of communication (Riffe et al., 2005). By nature, quantitative content analysis is systematic and replicable (Riffe et al., 2005), which is important to note as this study was conducted during the COVID-19 pandemic in 2020. The reciprocity of this study allows for its replication during other years without the impact of messaging during a global pandemic. Using this methodology, this study analyzed posts from Florida fruit and vegetable producers by gathering analytic metrics, including the number of likes, comments, and shares. Two coders collected the data for this study by visiting the Facebook pages of each farm in December 2021. All posts between January 1 and December 31, 2020 were copied and pasted into an Excel sheet. Researchers collected public information from the posts, including the post link, post message, post date, post type, number of comments, number of likes, number of other reactions, and number of shares, along with the total page likes and followers.

A census sample of Florida fruit and vegetable producers who submitted to the Florida Farm to You program was used. The sample was collected from a list provided by the Florida Department of Agriculture and Consumer Services of the fruit and vegetable producers who had submitted to the Florida Farm to You program between its inception in January 2020 and the export date of June 8, 2021. This list included 195 submissions. The submissions were sorted only to include a relevant sample of fruit and vegetable producers for this study. Of the fruit and vegetable submissions, 78 were duplicates or otherwise unusable, which allowed for 117 farms in objective one. Other objectives were focused on Facebook. Thus, farms without Facebook (n = 40) were removed; 77 had usable and active Facebook pages. Out of the 77 farms, 15 (19.48%) were randomly selected for deeper analysis to fulfill objectives two through four, which resulted in 1,111 posts in the subsample.

A codebook was created for two researchers to collect post data and code each post from the 15 farms. The codebook was created by a University of Florida agricultural communication graduate student and reviewed by an agricultural communication faculty member and subject-

matter experts. The codebook included post type (text only, event, link, photo, share, video, or miscellaneous) and seven post categories (local, Fresh from Florida, COVID-19, recipe/how-to, business post, agricultural business or non-agricultural business post, and customer testimonial). To fulfill objective one, one researcher searched for each of the 117 farms on Facebook, Twitter, and Instagram and searched for the farm website, if it had one, for associated social media platforms. Then, in objectives two and three, subsample post and engagement data were collected by copying and pasting information from Facebook pages to code the posts. To ensure interrater reliability, coders each coded 20% of the 1,111 post sample. Kappa tests were run using Statistical Package for Social Sciences (SPSS) 28, and coders reached an acceptable rate of 80% reliability to move forward and code individually (McHugh, 2012). Coders split the rest of the sample by every other farm and coded each of the remaining posts. Engagement rates of each individual post were calculated in SPSS using the formula (likes + reactions + comments + shares)/followers, a formula from Stebner et al. (2017), with the addition of a metric to include reactions (Gogolan, 2022). Data were analyzed in SPSS using descriptive statistics, including frequencies, percentages, means, standard deviations, minimums, and maximums. The average engagement rate of farms was examined on a line plot in Excel to determine natural breaks in the data.

Findings

Objective One: Producers' Social Media Presence

Of the 117 farms that submitted fruit and vegetable information to the Florida Farm to You Program, the majority (*f* = 79, 67.52%) were present on Facebook. Of the three social media platforms analyzed, Instagram was the second most frequent platform (*f* = 53, 45.30%), and the least frequent platform was Twitter (*f* = 11, 9.40%). Table 1 outlines the frequency and percentages of social media platforms on which Florida fruit and vegetable producers were present during 2020.

Table 1

Frequency and percentages of social media platforms for Florida fruit and vegetable producers (n = 117) in 2020.

Platform	*f*	Percent (%)
Facebook	79	67.52
Instagram	53	45.30
Twitter	11	9.40

Note. Percentages do not add up to 100% because producers could be present on multiple platforms.

Objective Two: Producers' Facebook Activity

Since research objective one identified Facebook as the most frequently used platform, 15 farms' Facebook pages were randomly selected for deeper-level analysis. Table 2 describes the Facebook activity for Florida fruit and vegetable producers between January 1 and December

31, 2020. The farm with the largest number of followers had 6,465 followers, and the farm with the lowest had 239 followers. The farms sampled had an average of 2,290.47 followers (*M* = 2290.47*)*. Posting 192 times, Farm J published the greatest number of posts during the sampled year, while Farm C posted the fewest, ten times during the same period. The average number of posts by all 15 farms was 74.06 (Table 2).

Table 2

Description of Facebook activity for Florida fruit and vegetable producers from January 1 to December 31, 2020.

Farm	Followers	Posts	Engagement Rate[a]		Likes		Comments		Reactions		Shares	
			M[c]	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
A	6465	191	0.01	0.01	26.25	32.80	5.20	18.44	5.02	7.25	3.55	9.26
B	4600	129	0.03	0.04	61.42	54.02	14.95	33.83	13.54	24.12	38.47	122.06
C	3247	22	0.13	0.09	150.05	178.06	31.05	21.52	29.18	20.79	44.09	51.70
D	3047	54	0.01	0.04	30.94	94.47	2.50	5.00	3.89	9.47	3.09	10.19
E	2918	77	0.05	0.08	96.08	140.24	23.97	34.18	20.87	44.67	18.29	43.55
F	2876	105	0.01	0.02	16.13	47.69	3.37	6.22	5.39	6.12	2.15	6.35
G	2419	119	0.01	0.01	15.69	13.02	4.85	7.15	4.21	5.79	4.92	12.18
H	1746	19	0.02	0.02	10.84	9.72	8.37	17.12	3.63	4.09	3.32	5.79
I	1714	55	0.03	0.08	20.82	45.59	2.27	10.81	6.16	9.17	16.96	92.67
J	1608	192	0.01	0.01	8.67	6.46	1.14	2.42	1.91	2.65	2.79	3.13
K	1577	18	0.02	0.06	17.44	10.87	9.67	8.59	3.06	3.01	7.72	12.99
L	919	51	0.01	0.02	9.65	10.13	2.37	3.91	0.73	1.51	0.75	1.00
M	674	47	0.03	0.02	14.60	8.18	0.79	1.22	1.30	1.53	3.09	3.21
N	308	20	0.01	0.01	2.95	1.61	0.05	0.22	0.55	0.76	0.40	0.60
O	239	12	0.32	0.35	53.42	60.37	2.33	4.38	3.33	6.04	16.50	18.01
All Farms	2290[b]	74.06	0.05	0.06	35.66	47.55	7.53	11.67	6.85	9.80	11.07	26.18

Note. [a] Engagement rate (likes + reactions + comments + shares)/followers (Stebner et al., 2017); [b] Rounded to the nearest follower; [c] Average engagement rate on Facebook is 0.07 (Statista, 2023). A good engagement rate is between .01 and .05 (Sehl & Tien, 2023).

Objective Three: Types of Facebook Posts Used by Producers

Researchers coded what type of posts the Florida fruit and vegetable producers used. The most frequent post types included a photo (*f* = 656, 59.0%), share (*f* = 172, 15.5%), and text only (*f* = 134, 12.1%). The least frequent post type included miscellaneous (*f* = 11, 1.0%), event (*f* = 22, 2.0%), and link preview (*f* = 27, 2.4%). Table 3 reflects the frequencies and percentages of the coded post types for the Florida fruit and vegetable farm subsample between January 1 and December 31, 2020.

Table 3

Description of the frequencies and percentages of post types for the Florida fruit and vegetable farms combined between January 1 to December 31, 2020.

Post Type	*f*	Percent (%)
Photo	657	59.14
Share	172	15.48
Text only	134	12.06
Video	88	7.92
Link Preview	27	2.43
Event	22	1.98
Miscellaneous	11	0.99

Note. There were 1,111 posts in total.

Using the formula (likes + reactions + comments + shares)/followers from Stebner et al. (2017), with the addition of a metric to include reactions (Gogolan, 2022), the engagement rates of each individual post were calculated in SPSS. The post types with the highest engagement rate included miscellaneous (*M* = .32, *SD* = .38), photos (*M* = .02, *SD* = .05), and text only (*M* = .02, *SD* = .02). The post types with the lowest engagement rates included shares (*M* = .01, *SD* = .01), link previews (*M* = .01, *SD* = .01), and events (*M* = .00, *SD* = .00). Table 4 describes the engagement rates combined by post type for Florida fruit and vegetable farms between January 1 and December 31, 2020.

Table 4

Description of engagement rates combined by post type for Florida fruit and vegetable farms from January 1 to December 31, 2020.

	Engagement Rate			
Post Type	*M*	*SD*	Minimum	Maximum
Miscellaneous	0.32	0.38	0.00	0.95
Photo	0.02	0.05	0.00	0.59
Text only	0.02	0.02	0.00	0.15
Video	0.02	0.04	0.00	0.38
Share	0.01	0.02	0.00	0.19
Link Preview	0.01	0.01	0.00	0.06
Event	0.00	0.00	0.00	0.00

Note. Engagement rate was calculated (likes + reactions + comments + shares)/followers from Stebner et al. (2017).

In addition to post type, posts were coded by post categories, including customer testimonials, recipe/how-to, and business posts. Table 5 reflects the frequencies and percentages of post

categories, with business posts being the most frequent (*f* = 503, 45.3%) and customer testimonials being the least frequent (*f* = 30, 2.7%).

Table 5

Description of the frequencies and percentages of post types for the Florida fruit and vegetable farms combined between January 1 to December 31, 2020 (n = 1,111).

Post Category	*f*	Percent (%)
Business Post	503	45.3
Recipe/How-to	62	5.6
Customer Testimonial	30	2.7

Note. Percentages do not add up to 100% because posts could fall into multiple categories or not fall into any of these categories. Percentages were calculated based on the total posts in the sample (*n* = 1,111).

Objective Four: Define Farm Engagement Rate Levels by Strategy

To answer research objective four, average engagement rate of farms was examined on a line plot in Excel to determine natural breaks in the data. Based on natural data breaks, farms were divided into three levels based on the average engagement rate of posts. High engagement farms were defined as having an average engagement rate of .05 or greater, medium engagement farms had an engagement rate greater than .01 but less than .05, and low engagement farms had an engagement rate of .01 or lower. Three farms had high engagement rates, five had a medium average engagement rate, and seven had low. The total number of posts for farms with high engagement rates was 99 posts, for an average post rate of 33 posts per farm; the total posts from farms with medium engagement was 269 posts, for an average post rate of 53.6 posts per farm; and the farms with low engagement rates had a total of 732 posts, for an average post rate of 104.57 posts per farm. The engagement rate was calculated by using (likes + reactions + comments + shares)/followers from Stebner et al. (2017), with the addition of a metric to include reactions (Gogolan, 2022). Table 6 provides the frequencies and percentages of post categories by engagement rate levels.

Table 6

Frequencies and percentages of post categories by engagement level (n = 1,111).

	High Engagement (n = 99)		*Medium Engagement (n = 269)*		*Low Engagement (n = 732)*	
Post Category	*f*	*%*	*f*	*%*	*f*	*%*
Business Post	70	70.71	70	26.12	360	49.20
Photo	58	58.59	163	60.45	436	59.56
Text Only	26	26.26	27	10.07	81	11.07
Share/Repost	11	11.11	61	22.76	100	13.66
Miscellaneous	6	6.06	5	1.87	0	0
Video	4	4.04	13	4.85	73	9.97
Link Preview	4	4.04	0	0	23	23.23
Recipe/How-to	3	3.03	12	4.48	47	6.42
Customer Testimonial	2	2.02	2	0.75	19	2.60
Event	2	2.02	1	0.37	19	2.60

Note. Percentages were calculated based on the total posts in each engagement rate category. Engagement rates were plotted and defined by data breaks as low (≤ .01), medium (> .01 and < .05), and high (≥ .05).

Conclusions, Discussion, and Recommendations

For farms, communication directors of farms, agricultural organizations, and agricultural commodity groups, this study provides an analysis of current Facebook content and engagement rates. Although the data cannot be generalized outside of this specific population, it can serve as a benchmark for setting and reaching future communication goals when planning farm social media strategy on Facebook. This work adds to the literature by defining a benchmark for low (≤ .01), medium (> .01 and < .05), and high (≥ .05) engagement rates for farms on Facebook.

Results of research objective one indicated producers were using social media to connect with consumers, but there continues to be an opportunity for growth. In this study, farms' primary focus was on Facebook. Over half of the sampled farms were not taking advantage of opportunities to sell directly to consumers on Instagram. Agricultural communicators should continue to work with farms on how to use social media, particularly during crises like COVID-19, which influenced producers' ability to market and sell products. Moreover, with consumers' growing interest in local food, fruit and vegetable producers could close the gap between agricultural production and consumers through targeted social media marketing. Future research should investigate posts related to selling local foods and evaluate the effectiveness of these campaigns.

Findings from research objective two indicate that while engagement rates were relatively low, the average engagement rate (0.05) was comparable with the 2023 average Facebook engagement rate for all accounts (0.07) by Statista (2023) and could serve as an industry benchmark. While the sampled farms' followers varied between 239 and 6,465 followers, the findings reflected an average of 2,290 followers, which could be a baseline Facebook follower goal for Florida fruit and vegetable producers.

Research objective three found that photos were the most frequently used post type; however, the engagement rate between photo and text only did not differ much. Perhaps fruit and vegetable producers do not need to include photos in every post and could use the text-only function to post updates and connect with consumers without significantly impacting the farm's engagement rate. The miscellaneous posts could have performed the best due to being boosted, as these posts exhibited options only available to boosted posts. This may provide evidence that boosting posts increases engagement and may allow farms to reach new audiences. Occasionally, boosting posts during important seasons could be a part of farms' social media strategy to reach new customers and increase engagement.

Of the post categories coded, business posts were used most frequently, indicating that the sampled fruit and vegetable producers use Facebook to market and sell products to consumers. The fruit and vegetable producers used recipe/how-to posts and customer testimonials less frequently. This kind of content could take more content development and be more challenging for producers to incorporate into their social media strategy than business posts.

Research objective four defined a benchmark for farm engagement rates on Facebook as low ($\leq .01$), medium ($> .01$ and $< .05$), and high ($\geq .05$). Results showed that farms with the highest engagement rate posted an average of 33 posts per farm, the medium engagement farms posted an average post rate of 53.6 posts per farm, and the farms with the lowest engagement posted an average of 104.57 posts per farm. This indicates that posting more frequently may not increase the engagement rate. Perhaps fruit and vegetable producers do not have to maintain social media presence when their product is not in season, as consumers may be seeking information about their business and engaging with less frequent posts that provide more relevant and valuable information. The farms with the highest engagement rate may have only been posting during the active buying season for their crop, which is an average of 6 months (FDACS, 2021).

Acknowledgements

Funding for this research was provided by the Center for Rural Enterprise Engagement, a partner Center of the UF/IFAS Center for Public Issue Education in Agriculture and Natural Resources. The authors would like to thank the Florida Department of Agriculture and Consumer Services for connecting researchers with farmers enrolled in the Florida Farms to You program and Naik Wali, a visiting PhD Scholar, for his support in the data collection for this research.

Author Contributions

O. Doyle - formal analysis, investigation, writing-original draft; **L. Baker** - conceptualization, methodology, review and editing, supervision, resources, funding acquisition; **A. Zagonel** - writing-review and editing; **R. Telg** - writing-review and editing.

References

Bowman, B., Settle, Q., Riggs, A., Tomas, S., & King, A. E. H. (2020). Characteristics of Oklahoma agritourism Facebook posts. *Journal of Applied Communications*, *104*(1). https://doi.org/10.4148/1051-0834.2294

Constine, J. (2016, September 6). *How Facebook news feed works*. TechCrunch. https://techcrunch.com/2016/09/06/ultimate-guide-to-the-news-feed/

Dascau, L. (2022, July 19). *Top 12 most important Facebook metrics to track and monitor in 2023.* Social Insider. https://www.socialinsider.io/blog/facebook-metrics/

De Choudhury, M., Morris, M. R., & White, R. W. (2014). Seeking and sharing health information online: Comparing search engines and social media. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, 1365–1376. https://doi.org/10.1145/2556288.2557214

Facebook IQ. (2016, June 21). *Defining metrics that matter.* Meta. https://www.facebook.com/business/news/insights/defining-the-metrics-that-matter

Field, A. (2000). *Discovering statistics using SPSS for Windows: Advanced techniques for the beginner*. Sage Publications.

Florida Department of Agriculture and Consumer Services. (2021). *Crops in season*. https://www.fdacs.gov/Consumer-Resources/Buy-Fresh-From-Florida/Crops-in-Season

Goh, K., Heng, C., & Lin, Z. (2013). Social media brand community and consumer behavior: Quantifying the relative impact of user-and marketer-generated content. *Information Systems Research*, *24*(1), 88–107. https://doi.org/10.1287/isre.1120.0469

Gogolan, D. (2022, January 11). *Engagement rate for all social media platforms*. Social Insider. https://www.socialinsider.io/blog/engagement-rate/#c1

Graybill-Leonard, M., Meyers, C., Doerfert, D., & Irlbeck, E. (2011). Using Facebook as a communication tool in agricultural-related social movements. *Journal of Applied Communications*, *95*(3). https://doi.org/10.4148/1051-0834.1164

Hays, S., Page, S. J., & Buhalis, D. (2013). Social media as a destination marketing tool: Its use by national tourism organizations. *Current Issues in Tourism, 16*(3), 211–239. https://doi.org/10.1080/13683500.2012.662215

Kapoor, K. K., Tamilmani, K., Rana, N. P., Patil, P., Dwivedi, Y. K., & Nerur, S. (2018). Advances in social media research: past, present and future. *Information Systems Frontiers*, *20*(3), 531–558. https://doi.org/10.1007/s10796-017-9810-y

Kincaid, J. (2009, February 9). *Facebook activates "Like" button; Friend feed tires of sincere flattery*. TechCrunch. https://techcrunch.com/2009/02/09/facebook-activates-like-button-friendfeed-tires-of-sincere-flattery/

Kite, J., Foley, B. C., Grunseit, A. C., & Freeman, B. (2016). Please like me: Facebook and public health communication. *PLOS ONE*, *11*(9), e0162765. https://doi.org/10.1371/journal.pone.0162765

Lunden, I. (2020, April 17). *Facebook adds new 'care' emoji reactions on its main app and in Messenger*. TechCrunch. https://techcrunch.com/2020/04/17/facebook-adds-new-care-emoji-reactions-on-its-main-app-and-in-messenger/

McLachlan, S., & Newberry, C. (2021, July 14). 23 Simple Ways to Increase Facebook Engagement (Free Calculator). Hootsuite. https://blog.hootsuite.com/increase-facebook-engagement

Maryville University. (n.d.). *The evolution of social media: How did it begin, and where could it go next?* https://online.maryville.edu/blog/evolution-social-media/

Mangalindan, J. (2015, June 10). *Facebook now wants you to explore what's trending in 5 topics*. Mashable. https://mashable.com/archive/facebook-experiment-trending-topics#Ht7IqHXh55qo

Mason, A. N., Narcum, J., & Mason, K. (2021). Social media marketing gains importance after Covid-19. *Cogent Business & Management*, *8*(1), 1870797. https://doi.org/10.1080/23311975.2020.1870797

McLeod-Morin, A., Beattie, P., Rampold, S., & Telg, R. (2020). Exploring social media engagement of a mosquito control campaign: Comparing engagement rates per content type and content frame. *Journal of Applied Communications*, *104*(1). https://doi.org/10.4148/1051-0834.2299

Newton, C. (2016, February 24). *Facebook rolls out expanded Like button reactions around the world*. The Verge. https://www.theverge.com/2016/2/24/11094374/facebook-reactions-like-button

Owen, R., & Humphrey, P. (2010). The structure of online marketing communication channels. *Journal of Management and Marketing Research*. https://www.researchgate.net/publication/241326160_The_structure_of_online_marketing_communication_channels

Riffe, D., Lacy, S., & Fico, F. G. (2005). *Analyzing media messages: Using quantitative content analysis in research* (2nd ed.). Lawrence Erlbaum Associates Publishers.

Reese, S. D., Gandy Jr, O. H., & Grant, A. E. (Eds.). (2001). *Framing public life: Perspectives on media and our understanding of the social world*. Routledge.

Sehl, K., & Tien, S. (2023, February 22). Engagement rate calculator + guide for 2023. *Hootsuite.* https://blog.hootsuite.com/calculate-engagement-rate

Shah, A. M., Zahoor, S. Z., & Qureshi, I. H. (2019). Social media and purchasing behavior: A study of the mediating effect of customer relationships. *Journal of Global Marketing*, *32*(2), 93–115. https://doi.org/10.1080/08911762.2018.1497243

Statista. (2023, January). *Most popular social networks worldwide as of January 2023, ranked by number of active users*. https://www.statista.com/statistics/272014/global-social-networks-ranked-by-number-of-users/

Stebner, S., Baker, L. M., Peterson, H. H., & Boyer, C. R. (2017). Marketing with more: An in-depth look at relationship marketing with new media in the green industry. *Journal of Applied Communications, 101*(2), 7–18. https://doi.org/10.4148/1051-0834.1001

Vilsack, T. (2014, January 13). *USDA secretary Tom Vilsack addresses American Farm Bureau convention*. United States Department of Agriculture. https://www.usda.gov/media/transcripts-speeches/2014/01/13/usda-secretary-tom-vilsack-addresses-american-farm-bureau