Research Square

Preprints are preliminary reports that have not undergone peer review.
They should not be considered conclusive, used to inform clinical practice,
or referenced by the media as validated information.

Digital food safety communication on YouTube: quality, reliability and evidence gaps in safe meat cooking videos

Ahmet Çelik

ahmet.celik@dicle.edu.tr

Dicle University

Ömer Faruk Yeşil

Dicle University

Article

Keywords: food safety, safe meat cooking, YouTube, consumer information, foodborne pathogens, risk communication

Posted Date: November 6th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-11243567/v1

License: This work is licensed under a Creative Commons Attribution 4.0 International License.
Read Full License

Additional Declarations: No competing interests reported.

Abstract

Safe meat cooking is a key consumer-level control against foodborne pathogens, but many consumers seek practical cooking guidance from social media platforms where scientific oversight is limited. This cross-sectional study evaluated the quality, reliability and evidence gaps of English-language YouTube videos on safe meat cooking. On 13 November 2025, the first 180 videos retrieved with the search term "safe meat cooking" were screened, and 40 eligible videos were analysed. Two food-specialist evaluators independently scored the videos using a content-specific Video Content Quality Score, the Global Quality Scale and a five-item modified DISCERN tool. The mean Video Content Quality Score was 10.59 ± 4.16 out of 20, indicating moderate completeness. Mean Global Quality Scale and modified DISCERN scores were 3.40 ± 1.01 and 3.27 ± 1.04, respectively. Educational and individual uploaders did not differ significantly in quality or reliability scores, whereas individual videos showed higher interaction rates. Item-level analysis identified gaps in explicit source citation, additional learning resources, raw-meat handling hygiene and pathogen-risk explanation. Viewer popularity metrics were not significantly associated with quality or reliability scores. These findings suggest that accessible digital cooking content should not be assumed to be evidence-based and highlight the need for expert-reviewed food safety communication online.

Introduction

Food safety is a public health and consumer-protection issue because unsafe food preparation can expose households to preventable biological hazards. Meat preparation is particularly important, as insufficient cooking, inadequate separation of raw and cooked foods and poor hygiene may support the survival or transfer of foodborne pathogens such as Salmonella spp., Escherichia coli O157:H7 and Campylobacter spp.[1,2]

Evidence-based safe meat cooking involves reaching appropriate internal temperatures, using a food thermometer, observing resting times where applicable, avoiding cross-contamination and applying hygienic handling procedures during raw meat preparation.[3–5] However, consumers often rely on visual or sensory cues such as meat colour or juice clarity, even though these cues are not reliable substitutes for measuring internal temperature.[4] Effective risk communication therefore needs to translate food safety recommendations into practical, understandable and behaviour-oriented messages.

YouTube has become a major source of practical health, diet and food-related information for the public.[6,7] Its accessibility is valuable, but previous evaluations of health-related YouTube videos show that popularity and visibility do not necessarily correspond to scientific accuracy, completeness or reliability.[8,9] This concern is especially relevant for safe cooking advice, where incomplete or misleading messages may be reproduced in everyday household food preparation.

Prior YouTube studies in food and health contexts have addressed food poisoning, inflammatory bowel disease diets, cancer-related food recommendations, complementary feeding and food allergy, and have

generally reported heterogeneous quality and variable source transparency.[10–13,23] A recent YouTube-based food safety communication study also examined foodborne mycotoxin risk information, showing that engagement metrics should not be interpreted as markers of quality.[30] Safe meat cooking, however, represents a distinct consumer behaviour directly linked to pathogen control, internal temperature measurement and cross-contamination prevention. We therefore hypothesised that videos on safe meat cooking would show moderate and heterogeneous scientific completeness, that uploader type would not necessarily predict quality, and that viewer engagement metrics would be poorly associated with evidence-based quality. This study aimed to evaluate the quality, reliability and item-level evidence gaps of English-language YouTube videos on safe meat cooking.

Results

Video selection and descriptive characteristics

Among the 180 first-ranked videos screened, 40 videos met the eligibility criteria and were included in the final analysis (Fig. 1). Most included videos were uploaded from the United States (n = 34), followed by the United Kingdom (n = 2), Canada (n = 1), the Netherlands (n = 1), the United Arab Emirates (n = 1) and Japan (n = 1).

The included videos had been available online for a median of 2,115.50 days, and median duration was 5.81 minutes (Table 1). Viewer engagement metrics were highly skewed: the median interaction rate was 1.02, whereas values ranged from 0.00 to 25.00; the median viewing rate was 1,628.20, with a wide range from 4.33 to 1,600,559.60.

Overall quality, reliability and agreement between evaluators

The mean Video Content Quality Score was 10.59 ± 4.16 out of 20, indicating moderate scientific completeness of the safe meat cooking content. The mean Global Quality Scale score was 3.40 ± 1.01, and the mean modified DISCERN score was 3.27 ± 1.04 (Table 1).

Inter-rater reliability was excellent for all three instruments. ICC(A,2) was 0.997 for the Video Content Quality Score and 1.000 for both the Global Quality Scale and modified DISCERN. Exact agreement was 77.5% for the content-specific score and 100.0% for the other two instruments, while all paired ratings were within 1 point (Table 3).

Item-level evidence gaps

Item-level analysis showed that several core safe cooking messages were incompletely covered (Table 5). Scientific explanation of safe meat cooking and safe internal temperatures were adequately

addressed in 45.0% of videos each. Thermometer use, cooking time, resting time and cooking methods were adequately addressed in 47.5% of videos.

The most prominent gaps were related to transparency and supporting resources. Explicit source citation or source links in the video description were adequately provided in only 7.5% of videos, while 52.5% did not address this criterion. Additional learning resources were absent from 47.5% of videos. Raw-meat handling hygiene was not addressed in 32.5% of videos and was adequately addressed in 25.0%. Links between unsafe meat cooking and specific foodborne pathogens or diseases were adequately presented in 22.5%.

Uploader type and viewer engagement

Educational videos had remained online significantly longer than individual videos (3,240.35 ± 1,770.98 vs 1,788.26 ± 1,283.65 days; $p = 0.005$). However, the Video Content Quality Score did not differ significantly between educational and individual videos (10.09 ± 3.88 vs 10.96 ± 4.40; $p = 0.521$). Duration, Global Quality Scale, modified DISCERN score and viewing rate also did not differ significantly by uploader type (Table 2).

Individual videos showed a significantly higher interaction rate than educational videos (median 1.53 vs 0.55; $p < 0.001$). Because comments may be positive, negative, neutral or unrelated to scientific quality, interaction rate was interpreted as a measure of engagement rather than as a direct indicator of content accuracy.

Popularity metrics and quality indicators

Spearman correlation analysis showed no significant association between viewer popularity metrics and quality or reliability scores (Table 6). Views, likes, comments, interaction rate and viewing rate were not significantly correlated with Video Content Quality Score, Global Quality Scale or modified DISCERN score. These findings indicate that audience attention and platform engagement did not reliably identify videos with stronger evidence-based safe cooking content.

Discussion

This study found that English-language YouTube videos on safe meat cooking provided only moderate-quality and moderately reliable information. The results are relevant because safe meat cooking is a direct consumer-level control for foodborne pathogen risk. Videos that are easy to access and widely viewed may shape routine cooking practices, yet the present item-level analysis shows that many videos omit or only partially address core safety messages such as explicit source citation, raw-meat handling hygiene, pathogen-risk explanation and guidance to additional authoritative resources.

The findings align with previous YouTube evaluations in food and health contexts showing heterogeneous content quality and incomplete source transparency.[10–13,23] However, the present study adds a more specific food safety perspective by focusing on safe meat cooking rather than general diet advice or disease-specific nutrition. Unlike many health topics where incorrect information primarily affects knowledge or attitudes, unsafe meat cooking messages can be translated directly into household practices involving internal temperature control, cross-contamination and hygienic handling.

Uploader identity did not clearly separate higher-quality from lower-quality videos. Educational uploaders had longer online availability, but their quality and reliability scores did not differ significantly from those of individual uploaders. This suggests that institutional or educational identity alone is not sufficient; effective digital food safety communication should also include explicit source transparency, accurate internal temperature guidance, pathogen-risk framing and clear consumer-oriented explanations.

Individual videos achieved higher interaction rates despite not having higher quality or reliability scores. This pattern supports the view that engagement metrics should not be used as a proxy for scientific credibility. Similar concerns have been raised in broader health-video literature, where highly visible content may be popular because it is emotionally engaging, concise, algorithmically promoted or easier to understand rather than because it is more accurate.[8,9,14] A related food safety communication study on mycotoxin risks also reported that engagement indicators did not reliably identify stronger scientific content.[30]

The item-level results provide practical guidance for improving online food safety education. Future videos should clearly state that external appearance is not a reliable indicator of internal safety, provide current internal temperature recommendations, demonstrate thermometer use, explain cross-contamination prevention and link recommendations to authoritative sources. These elements would allow educational videos to move beyond general cooking advice toward verifiable risk-reduction messages.

This study has limitations. The analysis included only English-language videos retrieved with a single search term on a single predefined date. YouTube search results are dynamic and may vary by time, location, user history and platform algorithms. The dataset should therefore be interpreted as a cross-sectional snapshot of search results and video-level engagement metrics on 13 November 2025, not as a continuously updated representation of the platform. The Video Content Quality Score was developed specifically for this study and should be interpreted as a content-specific checklist rather than as a fully validated psychometric scale. The modified DISCERN instrument was originally developed for consumer health information and not specifically for food safety videos. Finally, this study assessed content quality and engagement metrics but did not measure viewers' comprehension, risk perception or behavioural change.

Despite these limitations, the results highlight an important gap in digital food safety communication. Safe meat cooking videos were accessible and often engaging, but popularity did not identify content

that was more complete or more reliable. Professional societies, public agencies, food safety educators and academic institutions should consider developing concise, visually clear and regularly updated videos that present evidence-based safe cooking practices in consumer language.

Methods

Study design and ethical considerations

This study was designed as a cross-sectional observational analysis of publicly available online videos. The investigation did not involve direct contact with human participants, identifiable private data, animals, biological material or experimental procedures. Therefore, formal research ethics committee approval was not required. The analysis was limited to public information available on YouTube (Google LLC, San Bruno, CA, USA) and Google Trends (Google LLC, Mountain View, CA, USA), and procedures were planned to respect the terms of service and privacy policies of the platforms.

Search strategy and video selection

The search was performed on 13 November 2025 to reduce bias caused by the dynamic nature of online video platforms. The term "safe meat cooking" was selected after comparison with related queries such as "meat temperature food safety" and "how to cook meat" in Google Trends. The first 180 videos retrieved using this term were screened. This approach was adopted because previous studies of online health-seeking behaviour indicate that users tend to concentrate their attention on the first group of search results.[14]

Eligibility criteria

Videos were eligible if they were in English and directly addressed at least one core component of safe meat cooking, including internal cooking temperature, hygienic handling of raw meat, prevention of cross-contamination, thermometer use, resting time or foodborne illness risk. Videos were excluded if they were designed only for children as animated content, unrelated to meat cooking safety, focused only on general recipes or entertainment, addressed general hygiene without relevant meat cooking information or were presented in languages other than English. After screening, 40 videos were included in the final analysis.

Variables recorded

For each included video, upload date, duration, number of views, likes, comments and country of origin were recorded when available from the video or channel information. The number of days since upload was calculated as an indicator of online availability. Uploaders were classified as educational when the

channel belonged to or clearly represented academic institutions, health or food safety professionals, public agencies or educational organisations. Channels without professional or institutional affiliation were classified as individual uploaders.

Content quality and reliability assessment

The selected videos were assessed using three complementary tools. First, a content-specific Video Content Quality Score was developed a priori to evaluate the scientific completeness and practical relevance of safe meat cooking information. The item pool was prepared after reviewing internationally used food safety guidance and the scientific literature on safe meat preparation, thermometer use, cross-contamination prevention and foodborne disease prevention.[1–5] Because this score was developed for the present study, it should be interpreted as a content-specific checklist rather than as a fully validated psychometric scale.

The Video Content Quality Score included ten items addressing: scientific explanation of meat cooking safety; safe internal temperatures for red meat, poultry and fish; the limitation of external appearance as an indicator of internal safety; links with foodborne pathogens; depth of practical information; thermometer use, cooking time, resting time and cooking methods; hygiene during raw meat handling; referral to additional learning resources; use of reliable sources; and explicit reporting of sources or links in the video description. Each item was scored as 0 for not addressed, 1 for partially addressed and 2 for adequately addressed, with total scores ranging from 0 to 20 (Table 4).

Second, the Global Quality Scale was used to evaluate the overall flow, clarity, educational value and practical usefulness of each video. This five-point scale ranges from very poor quality to excellent quality and has been widely applied in online health information assessments.[16,17] Third, a five-item modified DISCERN tool was applied to assess source use, balance, audience appropriateness and reliability of consumer-oriented information, with total scores ranging from 0 to 5.[18–20]

Evaluator procedure

All videos were independently evaluated by two experts with doctoral-level education in food-related disciplines. One evaluator had expertise in veterinary food hygiene and technology, and the other had expertise in food-related biological sciences. Inter-rater reliability for paired total scores was calculated using ICC(A,2), defined as a two-way random-effects, absolute-agreement intraclass correlation coefficient for the mean of two raters. Bootstrap confidence intervals were obtained from 10,000 video-level bootstrap samples. Exact agreement and within-one-point agreement were also calculated. Because inter-rater reliability was excellent for all scoring instruments, consensus scores were used for final analysis.

Viewer engagement metrics

Viewer engagement was assessed using interaction rate and viewing rate, which are frequently used in online video studies.[21,22] Interaction rate was calculated by dividing the sum of likes and comments by the total number of views and multiplying by 100. Viewing rate was calculated by dividing total views by the number of days since upload and multiplying by 100. Because comments may be positive, negative, neutral or unrelated to scientific accuracy, interaction rate was interpreted only as a measure of engagement.

Statistical analysis

Statistical analyses were performed using IBM SPSS Statistics, version 27.0 (IBM Corp., Armonk, NY, USA). The distribution of continuous variables was evaluated using the Kolmogorov-Smirnov and Shapiro-Wilk tests. Because the sample size was less than 50, the Shapiro-Wilk test was used as the primary criterion for normality. Normally distributed variables were compared using the independent samples t-test, whereas non-normally distributed variables were compared using the Mann-Whitney U test. Spearman correlation analysis was used to assess relationships between video metrics and quality or reliability scores. Descriptive statistics were reported as mean ± standard deviation or median with interquartile range and minimum-maximum values, according to distributional characteristics. A p value below 0.05 was considered statistically significant.

Declarations

Ethics approval and informed consent

The study used publicly available online video data and did not involve human participants, identifiable private data, animals or biological material. The two expert evaluators involved in the video assessment were the study authors (A.C. and O.F.Y.). Informed consent was obtained from all experts for their involvement in the expert assessment and for the use of their paired ratings in this study.

Data availability

All data supporting the findings of this study are available within the article and in Supplementary Data 1, which has been uploaded with this submission. Supplementary Data 1 contains the video-level dataset used for the analyses, including recorded video characteristics, uploader classification, engagement metrics and quality/reliability scores. The dataset represents YouTube search results and video-level engagement metrics recorded on 13 November 2025 and should be interpreted as a cross-sectional snapshot of the platform on that date.

Acknowledgements

The authors have no acknowledgements to declare.

Author contributions

A.C. contributed to conceptualisation, methodology, investigation, data curation, formal analysis, writing - original draft, writing - review and editing, and project administration. O.F.Y. contributed to conceptualisation, methodology, investigation, data curation, formal analysis, writing - original draft, and writing - review and editing. Both authors read and approved the final manuscript.

Competing interests

The authors declare no competing interests.

Additional information

Correspondence and requests for materials should be addressed to A.C.

References

1. Centers for Disease Control and Prevention. Foodborne germs and illnesses. https://www.cdc.gov/food-safety/foodborne-germs/index.html (2021). Accessed 6 July 2026.
2. World Health Organization. Foodborne diseases. https://www.who.int/news-room/fact-sheets/detail/foodborne-diseases (2023). Accessed 6 July 2026.
3. United States Department of Agriculture Food Safety and Inspection Service. Safe minimum internal temperature chart. https://www.fsis.usda.gov/food-safety/safe-food-handling-and-preparation/food-safety-basics/safe-temperature-chart (2022). Accessed 6 July 2026.
4. Chambers, E. 4th, Godwin, S. & Terry, T. Recipes for determining doneness in poultry do not provide appropriate information based on US government guidelines. Foods 7, 126 (2018). https://doi.org/10.3390/foods7080126
5. Soon-Sinclair, J. M. et al. Consumers' raw poultry washing practices: a cross-sectional and observational study in eight Southeast Asian countries. Food Control 158, 110253 (2024). https://doi.org/10.1016/j.foodcont.2023.110253
6. Pew Research Center. 10 facts about Americans and YouTube. https://www.pewresearch.org/fact-tank/2019/12/04/10-facts-about-americans-and-youtube/ (2019). Accessed 6 July 2026.
7. Pew Research Center. Many Americans get news on YouTube, where news organizations and independent producers thrive side by side.

https://www.pewresearch.org/journalism/2020/09/28/many-americans-get-news-on-youtube-where-news-organizations-and-independent-producers-thrive-side-by-side/ (2020). Accessed 6 July 2026.

8. Madathil, K. C., Rivera-Rodriguez, A. J., Greenstein, J. S. & Gramopadhye, A. K. Healthcare information on YouTube: a systematic review. Health Informatics Journal 21, 173-194 (2015). https://doi.org/10.1177/1460458213512220
9. Loeb, S. et al. Dissemination of misinformative and biased information about prostate cancer on YouTube. European Urology 75, 564-567 (2019). https://doi.org/10.1016/j.eururo.2018.10.056
10. Li, M., Yan, S., Yang, D., Li, B. & Cui, W. YouTube as a source of information on food poisoning. BMC Public Health 19, 952 (2019). https://doi.org/10.1186/s12889-019-7297-9
11. Gkikas, K. et al. YouTube as a source of information for food, diet-related items, and advisory comments for the management of inflammatory bowel disease. Inflammatory Bowel Diseases 30, 347-356 (2024). https://doi.org/10.1093/ibd/izad076
12. Segado-Fernandez, S. et al. Realfood and cancer: analysis of the reliability and quality of YouTube content. International Journal of Environmental Research and Public Health 20, 5046 (2023). https://doi.org/10.3390/ijerph20065046
13. Azak, M., Korkmaz, N., Sahin, K. & Gozen, D. Evaluation of YouTube videos on complementary feeding: content quality and reliability analysis. Appetite 188, 106766 (2023). https://doi.org/10.1016/j.appet.2023.106766
14. Desai, T., Shariff, A., Dhingra, V., Minhas, D., Eure, M. & Kats, M. Is content really king? An objective analysis of the public's response to medical videos on YouTube. PLOS ONE 8, e82469 (2013). https://doi.org/10.1371/journal.pone.0082469
15. Basch, C. H., Hillyer, G. C., Meleo-Erwin, Z., Jaime, C. & Basch, C. E. Preventive behaviours conveyed on YouTube to mitigate transmission of COVID-19: cross-sectional study. JMIR Public Health and Surveillance 6, e18807 (2020). https://doi.org/10.2196/18807
16. Bernard, A., Langille, M., Hughes, S., Rose, C., Leddin, D. & Veldhuyzen van Zanten, S. A systematic review of patient inflammatory bowel disease information resources on the World Wide Web. American Journal of Gastroenterology 102, 2070-2077 (2007). https://doi.org/10.1111/j.1572-0241.2007.01325.x
17. Zengin, O. & Onder, M. E. Educational quality of YouTube videos on musculoskeletal ultrasound. Clinical Rheumatology 40, 4243-4251 (2021). https://doi.org/10.1007/s10067-021-05793-6
18. Charnock, D., Shepperd, S., Needham, G. & Gann, R. DISCERN: an instrument for judging the quality of written consumer health information on treatment choices. Journal of Epidemiology and Community Health 53, 105-111 (1999). https://doi.org/10.1136/jech.53.2.105
19. Kocyigit, B. F. & Akyol, A. YouTube as a source of information on COVID-19 vaccination in rheumatic diseases. Rheumatology International 41, 2109-2115 (2021). https://doi.org/10.1007/s00296-021-05010-2

20. Elangovan, S., Kwan, Y. H. & Fong, W. The usefulness and validity of English-language videos on YouTube as an educational resource for spondyloarthritis. Clinical Rheumatology 40, 1567-1573 (2021). https://doi.org/10.1007/s10067-020-05377-w
21. Kaya, C. A. Evaluating YouTube videos on ruminal acidosis: integrating human and artificial intelligence assessment for quality and reliability. Revista Cientifica de la Facultad de Ciencias Veterinarias 36, e361811 (2026). https://doi.org/10.52973/rcfcv-e361811
22. Ince Kuka, G. & Gursoy, H. Content quality and reliability of YouTube videos as a source of information about good oral hygiene practices in adults. PeerJ 12, e18183 (2024). https://doi.org/10.7717/peerj.18183
23. Reddy, K. et al. YouTube and food allergy: an appraisal of the educational quality of information. Pediatric Allergy and Immunology 29, 410-416 (2018). https://doi.org/10.1111/pai.12885
24. Yavuz, M. C., Buyuk, S. K. & Genc, E. Does YouTube offer high quality information? Evaluation of accelerated orthodontics videos. Irish Journal of Medical Science 189, 505-509 (2020). https://doi.org/10.1007/s11845-019-02119-z
25. Samuel, N., Alotaibi, N. M. & Lozano, A. M. YouTube as a source of information on neurosurgery. World Neurosurgery 105, 394-398 (2017). https://doi.org/10.1016/j.wneu.2017.05.111
26. Wang, X., Sun, Y., Qu, X., Lei, T., Song, Y. & Deng, J. Is YouTube a useful source of information on home parenteral nutrition? BMC Public Health 25, 684 (2025). https://doi.org/10.1186/s12889-025-21929-8
27. Menziletoglu, D., Guler, A. Y. & Isik, B. K. Are YouTube videos related to dental implants useful for patient education? Journal of Stomatology, Oral and Maxillofacial Surgery 121, 661-664 (2020). https://doi.org/10.1016/j.jormas.2019.12.022
28. Cardakci Bahar, S. & Koca, O. YouTube videos as a source of information on necrotizing gingivitis: a content-quality analysis. Cureus 16, e61485 (2024). https://doi.org/10.7759/cureus.61485
29. Yildiz, M. B., Yildiz, E., Balci, S. & Ozcelik Kose, A. An evaluation of the quality, reliability, and educational content of YouTube videos as an information source for soft contact lenses. Eye and Contact Lens 47, 617-621 (2021). https://doi.org/10.1097/ICL.0000000000000795
30. Yesil, O. F. & Celik, A. Public communication of foodborne mycotoxin risks on YouTube: a cross-sectional assessment of video quality, reliability, and educational value. Toxins 18, 347 (2026). https://doi.org/10.3390/toxins18080347

Tables

Table 1. Descriptive characteristics of the analysed YouTube videos.

Parameter	n	Mean ± SD	Median (IQR)	Minimum-maximum
Time online [days]	40	2405.40±1656.72	2115.50 (1020.00-3609.75)	90.00-6576.00
Duration [min]	40	8.11±7.63	5.81 (3.40-10.40)	1.08-44.25
Video Content Quality Score	40	10.59±4.16	10.00 (7.50-14.62)	4.00-19.00
Global Quality Scale	40	3.40±1.01	4.00 (3.00-4.00)	1.00-5.00
Modified DISCERN score	40	3.27±1.04	3.00 (3.00-4.00)	1.00-5.00
Interaction rate [%]	40	2.53±5.17	1.02 (0.49-1.92)	0.00-25.00
Viewing rate	40	44719.42±252415.86	1628.20 (315.59-6588.88)	4.33-1600559.60

Values are presented as mean ± standard deviation, median (interquartile range), and minimum-maximum. Interaction rate and viewing rate showed skewed distributions; therefore, medians and interquartile ranges should be considered together with mean values. SD, standard deviation; IQR, interquartile range.

Table 2. Comparison of video characteristics and scores according to uploader type.

Parameter	Educational videos (n = 17)	Individual videos (n = 23)	Test	Statistic	p
Time online [days]	3240.35±1770.98	1788.26±1283.65	Independent samples t-test	t=3.010	0.005
Video Content Quality Score	10.09±3.88	10.96±4.40	Independent samples t-test	t=-0.648	0.521
Duration [min]	5.17 (3.17-7.41)	7.27 (4.21-11.81)	Mann-Whitney U test	U=140.5	0.132
Global Quality Scale	4.00 (3.00-4.00)	3.00 (2.50-4.00)	Mann-Whitney U test	U=242.0	0.178
DISCERN score	3.00 (3.00-4.00)	3.00 (2.00-4.00)	Mann-Whitney U test	U=228.0	0.348
Interaction rate	0.55 (0.15-0.92)	1.53 (0.94-3.57)	Mann-Whitney U test	U=69.0	<0.001
Viewing rate	2180.60 (1158.01-7325.35)	1381.46 (118.54-4580.77)	Mann-Whitney U test	U=227.0	0.389

Normally distributed variables are presented as mean ± standard deviation and were compared using the independent samples t-test. Non-normally distributed variables are presented as median (interquartile

range) and were compared using the Mann-Whitney U test. VCQ, Video Content Quality Score; GQS, Global Quality Scale.

Table 3. Inter-rater reliability of video scoring instruments.

Instrument	ICC(A,2)	95% bootstrap CI	Exact agreement	Within 1 point	Interpretation
Video Content Quality Score	0.997	0.994-0.999	31 (77.5%)	40 (100.0%)	Excellent
Global Quality Scale	1.000	1.000-1.000	40 (100.0%)	40 (100.0%)	Excellent
Modified DISCERN	1.000	1.000-1.000	40 (100.0%)	40 (100.0%)	Excellent

ICC(A,2), two-way random-effects, absolute-agreement intraclass correlation coefficient for the mean of two raters; CI, confidence interval. Confidence intervals are percentile intervals from 10,000 video-level bootstrap samples.

Table 4. Content assessment criteria used for the Video Content Quality Score, Global Quality Scale and modified DISCERN instrument.

Instrument and item	Assessment criterion or descriptor	Scoring
Video Content Quality Score 1	Was meat cooking safety, including internal temperature, cross-contamination, and hygiene, explained on a scientific basis?	0=no; 1=partial; 2=adequate
Video Content Quality Score 2	Were safe internal temperatures for different meat types, including red meat, poultry, and fish, provided accurately and according to current information?	0=no; 1=partial; 2=adequate
Video Content Quality Score 3	Was it stated that a cooked appearance on the outside does not necessarily mean that the inside is safe?	0=no; 1=partial; 2=adequate
Video Content Quality Score 4	Was a link established between foodborne diseases, including Salmonella, Escherichia coli, and Campylobacter, and meat cooking safety?	0=no; 1=partial; 2=adequate
Video Content Quality Score 5	Did the video include detailed practical information rather than only basic information?	0=no; 1=partial; 2=adequate
Video Content Quality Score 6	Were thermometer use, cooking times, resting times, and cooking methods, such as grilling, baking, or boiling, explained in detail?	0=no; 1=partial; 2=adequate
Video Content Quality Score 7	Were hygiene rules during handling of raw meat in the kitchen addressed?	0=no; 1=partial; 2=adequate
Video Content Quality Score 8	Were additional information or learning resources recommended?	0=no; 1=partial; 2=adequate
Video Content Quality Score 9	Was the information based on reliable sources, such as USDA, WHO, EFSA, or the Turkish Food Codex?	0=no; 1=partial; 2=adequate
Video Content Quality Score 10	Were sources clearly stated or shared in the video description?	0=no; 1=partial; 2=adequate
Global Quality Scale 1	Low quality; not useful.	1-5 global score
Global Quality Scale 2	Low quality, but some information is available.	1-5 global score
Global Quality Scale 3	Inadequate flow; some information is covered, but important topics are missing.	1-5 global score
Global Quality Scale 4	Good quality; important topics are addressed.	1-5 global score
Global Quality Scale 5	Excellent quality and flow.	1-5 global score
Modified DISCERN 1	Were the aims clearly stated?	0=no; 1=yes
Modified DISCERN 2	Were reliable information sources used?	0=no; 1=yes

Modified DISCERN 3	Was the information balanced and unbiased?	0=no; 1=yes
Modified DISCERN 4	Was information presented appropriately for the target audience?	0=no; 1=yes
Modified DISCERN 5	Were unclear points, research limitations, or missing information stated?	0=no; 1=yes

For the Video Content Quality Score, 0 = not addressed, 1 = partially addressed, and 2 = adequately addressed; total scores range from 0 to 20. The Global Quality Scale is a single global score from 1 to 5. The modified DISCERN score ranges from 0 to 5.

Table 5. Item-level distribution of Video Content Quality Score (VCQ) criteria among analysed videos.

VCQ item	Not addressed n (%)	Partially addressed n (%)	Adequately addressed n (%)	Mean ± SD
1. Scientific explanation of safe meat cooking	3 (7.5%)	19 (47.5%)	18 (45.0%)	1.38±0.63
2. Safe internal temperatures for meat types	6 (15.0%)	16 (40.0%)	18 (45.0%)	1.30±0.72
3. Cooked appearance not sufficient for safety	10 (25.0%)	13 (32.5%)	17 (42.5%)	1.18±0.81
4. Link to foodborne pathogens/disease	10 (25.0%)	21 (52.5%)	9 (22.5%)	0.97±0.70
5. Detailed practical information beyond basics	3 (7.5%)	24 (60.0%)	13 (32.5%)	1.25±0.59
6. Thermometer, cooking time, resting time, and methods	7 (17.5%)	14 (35.0%)	19 (47.5%)	1.30±0.76
7. Raw-meat handling hygiene	13 (32.5%)	17 (42.5%)	10 (25.0%)	0.93±0.76
8. Additional learning resources	19 (47.5%)	11 (27.5%)	10 (25.0%)	0.78±0.83
9. Use of authoritative/reliable sources	11 (27.5%)	19 (47.5%)	10 (25.0%)	0.97±0.73
10. Explicit source citation or video-description sources	21 (52.5%)	16 (40.0%)	3 (7.5%)	0.55±0.64

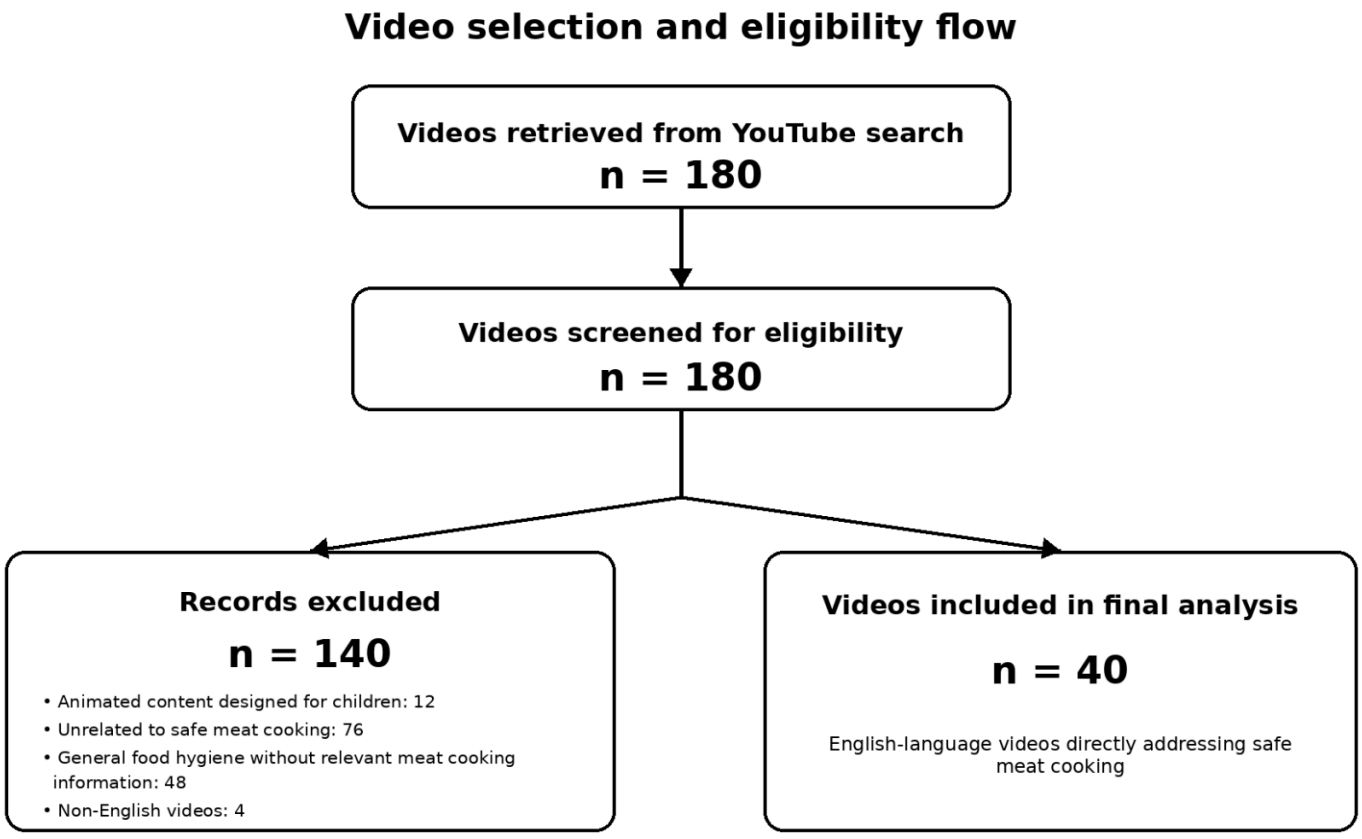
VCQ, Video Content Quality Score; SD, standard deviation. Percentages are calculated from the 40 analysed videos.

Table 6. Spearman correlations between video metrics and quality or reliability scores.

Video metric	VCQ rho (p)	GQS rho (p)	Modified DISCERN rho (p)
Time online (days)	-0.175 (0.280)	-0.280 (0.080)	0.002 (0.988)
Duration (min)	0.199 (0.219)	0.186 (0.250)	0.189 (0.242)
Views	-0.228 (0.157)	-0.082 (0.614)	-0.069 (0.674)
Likes	-0.177 (0.276)	-0.035 (0.831)	-0.060 (0.714)
Comments	-0.266 (0.097)	-0.141 (0.385)	-0.112 (0.491)
Interaction rate	0.125 (0.441)	0.076 (0.641)	-0.073 (0.653)
Viewing rate	-0.220 (0.172)	-0.017 (0.919)	-0.094 (0.563)

Values are Spearman correlation coefficients with p values in parentheses. VCQ, Video Content Quality Score; GQS, Global Quality Scale. Modified DISCERN refers to the five-item modified DISCERN reliability tool. None of the correlations between viewer popularity metrics and quality or reliability scores reached statistical significance.

Figures



Search performed on 13 November 2025 using the term "safe meat cooking". First 180 ranked videos were screened on a single day.

Figure 1

Flow diagram of video screening and inclusion. The search was performed on 13 November 2025 using the term "safe meat cooking". The first 180 ranked videos were screened on a single day to reduce platform variability.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- SupplementaryData1videodatasetEN.xlsx