

Nourishing Wildland Firefighters: Exploring Perspectives on Wildland Fire Incident Catering

David Flores, Myrium De Vroome, Michael Caggiano



Flores, David; De Vroome, Myrium; Caggiano, Michael. 2025. **Nourishing wildland firefighters: Exploring perspectives on wildland fire incident catering.** Gen. Tech. Rep. RMRS-GTR-448. Fort Collins, CO: U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station. 12 p.
<https://doi.org/10.2737/RMRS-GTR-448>

Abstract

The work environment for a wildland firefighter on an incident is both physically and mentally demanding, and for some, requires a high level of caloric intake from quality food sources provided by meal catering services. The aim of this exploratory study is to examine wildland firefighter perceptions of meal catering during wildfire incidents. We conducted seven, in-depth one-hour interviews with wildland firefighters with over four decades of wildland fire experience, in May and June 2024. Exploratory qualitative findings from seven interviews revealed the following themes (1) greater need for dietary choices, (2) negative and positive impacts on morale, (3) a desire for guidance on portion control, (4) the need for structured feedback mechanisms, and (5) suggestions to use the best available nutrition science for decisions on incident meal catering. This exploratory research addresses the need for a national study on current perceptions, experiences, and recommendations for the National Mobile Food Services contract and the multiple Mobile Food Services Units that deploy to wildland fires.

Keywords: Wildland firefighters, catering, nutrition, safety, recruitment, retention

Cover: Top—Firefighters receive food in the dinner line after a long day of working fires on the Mt. Hood National Forest in Oregon. USDA Forest Service photo by Preston Keres. Bottom—Firefighters working the Thomas Fire on the Los Padres National Forest. USDA Forest Service photo by Kari Greer.

All Rocky Mountain Research Station publications are published by U.S. Forest Service employees and are in the public domain and available at no cost. Even though U.S. Forest Service publications are not copyrighted, they are formatted according to U.S. Department of Agriculture standards and research findings and formatting cannot be altered in reprints. Altering content or formatting, including the cover and title page, is strictly prohibited.

The use of trade or firm names in the publication is for reader information and does not imply endorsement by the U.S. Department of Agriculture of any product or service.

Authors

David Flores is a Research Social Scientist with the Human Dimensions Program of the U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station in Fort Collins, Colorado. His research focuses on the social and cultural characteristics of decision making and natural resource management.

Myrium De Vroome is a Masters student in Resilient Farming and Food Systems at Wageningen University, the Netherlands. She interned at the U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Fort Collins, Colorado, March–June 2024.

Michael Caggiano is a wildland firefighter and regional fire analyst with the U.S. Department of Agriculture, Forest Service, in Fort Collins, Colorado. His work focuses on helping the national forests with strategic fire planning efforts in the preseason and supporting fire managers for risk informed decision-making during wildfire incidents.

Acknowledgments

This study would not have been possible without the participation of U.S. Forest Service wildland firefighters. We also thank the following reviewers: Dr. Rebekah Fox, Professor, Department of Communication Studies, Texas State University and Dr. Steven Venette, Professor, Department of Communication and Media Studies, University of Southern Mississippi.

This page intentionally left blank.

Contents

Abstract ii

Authors iii

Acknowledgments..... iii

Executive Summary..... 1

Introduction 2

 Purpose of This Study 2

 Background 2

Methods 3

 Interview Design and Structure..... 3

 Data Analysis..... 4

Findings 5

 Perceptions of Food Quality 5

 Dietary Choices During an Incident Response..... 6

 Morale and Autonomy..... 6

 Spike Camps and Social Media..... 7

 Summary..... 8

Discussion..... 8

 Assessment Limitations 9

Conclusion 10

References 11

This page intentionally left blank.

Executive Summary

Wildland firefighting involves sustained mental and physical awareness in strenuous work environments where firefighters work under conditions of heat, smoke, and across uneven terrain through 12–16-hour shifts. The general purpose of this study is to explore perceptions from wildland firefighters on the quality and experience of meal catering during wildland fire incident response. From May–June 2024, we conducted in-depth interviews with seven wildland firefighters who together have deployed to over 100 wildland fire incidents and who have experienced service from a variety of catering companies since the mid-1990s. Together, research participants have participated in incidents ranging from small local incidents where catering is often unavailable or provided locally, to large, long duration complex incidents where meals are supplied through the National Mobile Food Services (NMFS) contract.

The findings revealed:

1. Perceptions of food quality. Sack lunches were perceived as the most nutritionally inadequate of the three meals provided during the day. Participants reported concerns over sack lunches containing high levels of carbohydrates and processed sugar.
2. Dietary choices during incident response. Wildland firefighters risked potential problems with health and performance due to limiting their own daily caloric intake because of perceived unhealthy dietary options.
3. Morale and autonomy. Catering companies that provided high quality meals with varied food choices, as well as firefighters receiving per diem during an incident, are claimed to boost morale.
4. Spike camps. Staying in spike camps and receiving provisions to build their own meals was more desirable than returning to base camp for dinner and breakfast.
5. Social media. Participants reported that they often expressed their concerns regarding the quality and taste of catered meals with pictures and comments on social media, which can directly influence catering services during an incident.

Overall, participants reported various opportunities to improve the wildland fire catering system for incident response. Building upon findings from this exploratory study, the authors propose the need for a national study that includes greater societal awareness of the food industry along with current firefighter perceptions on the relationship between performance, safety, caloric intake, and food allergies. In addition, considering recent studies on the relationship between athletic performance and food intake could provide further insight into identifying opportunities to ensure wildland firefighters maintain situational awareness and safety during incident response and through the duration of the wildland fire season.

Introduction

Purpose of This Study

In the United States, working on a wildland fire incident often requires personnel to stay in a large, makeshift camp close to the fire where they can work daily 12–16-hour shifts for up to 14 consecutive days. Thus, it is common to deal with physical and mental fatigue during an incident response, which has implications for firefighter situational awareness and safety. A recent programmatic review of interagency hotshot crews—highly trained, specialized crews that perform some of the most demanding and hazardous tasks in wildland firefighting—found that hydration, nutrition, and sleep assist most in managing fatigue (USDA FS n.d.; USDA FS 2023). However, managing these health factors during an incident can be difficult. This programmatic study reveals that the “opportunity for quality rest is often not available at large fire camps due to constant noise activity, often forcing crews to look elsewhere for sleeping areas, such as camping near the fireline to maximize rest, which comes with the tradeoff of sacrificing decent food and access to hygiene facilities” (USDA FS 2023, p. 21). Additional studies of wildland firefighters (WLFF) have analyzed attitudes, experiences, and morale to improve WLFF recruitment and retention, as well as training, culture, technology, teamwork, mental health, leadership, infrastructure, safety, pay and benefits, and work-life balance (Belval et al. 2024; Flores and Haire 2022; Granberg et al. 2022; Granberg et al. 2023; Klossner et al. 2024; Wagner et al. 2025). Proper nutrition during wildland fire incidents is also instrumental in managing safety and morale (Brooks et al. 2021; Marks et al. 2020). Therefore, the aim of this exploratory study is to examine contemporary perceptions from WLFFs on the quality and experience of meal catering during wildfire incidents.

Background

Wildland fire occupations and the associated duties on a wildfire incident range from performing long hours of arduous work under dangerous conditions (e.g., conducting field operations) to working in sedentary positions conducting administrative work at an Incident Command Post (ICP). Nonetheless, all occupational positions during an incident require physical and mental demands including long workdays, extreme environments such as heat and moderate to high altitudes, noisy conditions, and sleep deprivation (Cuddy et al. 2007). Due to the intense occupational work requirements of wildfire incident response, providing high quality food sources throughout the workday is imperative to meet the required energy demands both throughout a potential 14–21 day response and during the continuous wildland fire season (Cuddy et al. 2007).

Just as athletes require specialized nutritional options to support mental and physical demands, recovery, and overall health (Jenner et al. 2019), WLFFs who are regularly involved in demanding wildland fire operations must consider the nutrients they consume to maintain a consistent high level of performance and alertness during a wildfire incident (Brooks et al. 2021). Deeper understanding of WLFF perceptions of food quality provided by the National Mobile Food Services (NMFS) contract sheds light on findings from previous studies that identify WLFF consumption patterns as failing to provide adequate nutrients for occupational demands (Marks et al. 2020) and showing

diminished health for WLFFs over the duration of the fire season (Coker et al. 2019). Addressing food quality and the organization of catering on wildland fire incidents may also lead to improvements in operational readiness, reduce fatigue, promote safety, and improve morale across the interagency wildland fire system. Ultimately these benefits may also improve recruitment and retention of the wildland fire workforce (Belval et al. 2024).

After interviewing WLFFs who, combined, have worked on hundreds of incidents, we were able to capture multiple perspectives from different incident types and variations in catering options. This includes receiving per diem, receiving food bins and ingredients to cook their own food, and acquiring catering services from local restaurants and through the NMFS contract.

Methods

For this rigorous, systematic qualitative investigation, in-depth interviews provided researchers access to the observations of people with expertise in the subject. This exploratory study used these interviews to learn about the wildland fire catering system and its quality from the perspective of catering recipients. In-depth interviews also provide the advantage of learning how events and experiences interact with thoughts, feelings, and emotions, which shape perceptions. This approach to using interviews is well-established as a means of gathering rich data to uncover detailed examples and explanations about each participant's perceptions (Weiss 1995). Research participants are expected to provide a great deal of information, nuance, and examples of experiences; therefore, qualitative studies are designed to uncover the different meanings behind social problems and to actively engage with participants on the complexity of their perspectives (Emerson, Fretz, and Shaw 1995).

Interview Design and Structure

The purposive interview sample was collected using a network of contacts from a co-author of this study who currently works in the field of wildland fire. In addition, one of the co-authors attended a prescribed fire training workshop in Oregon where she was able to reach out to additional potential participants. Moreover, at the conclusion of each interview, interviewees were asked to provide referrals for additional potential research participants. In total, fourteen WLFFs were contacted for an interview, ten responded to the interview request, and seven total in-depth interviews were conducted. Interviews were administered during May and June 2024. Each interview was conducted using the online platform Microsoft Teams and lasted approximately one hour. Interviews were also recorded and transcribed using Microsoft Teams.

In-depth interviews were conducted with Forest Service WLFFs from all Forest Service regions except the Intermountain Region¹. All participants were white males with no strict diet, allergy, or food intolerance. Six of the seven interviewees began working in wildland fire between 1994 and 2000. All interview participants have served in multiple occupations during wildland fire incidents ranging from positions that require arduous work to sedentary administrative occupations.

¹ The other Forest Service Regions are the Northern, Rocky Mountain, Southwestern, Pacific Southwest, Pacific Northwest, Southern, Eastern, and Alaska Regions.

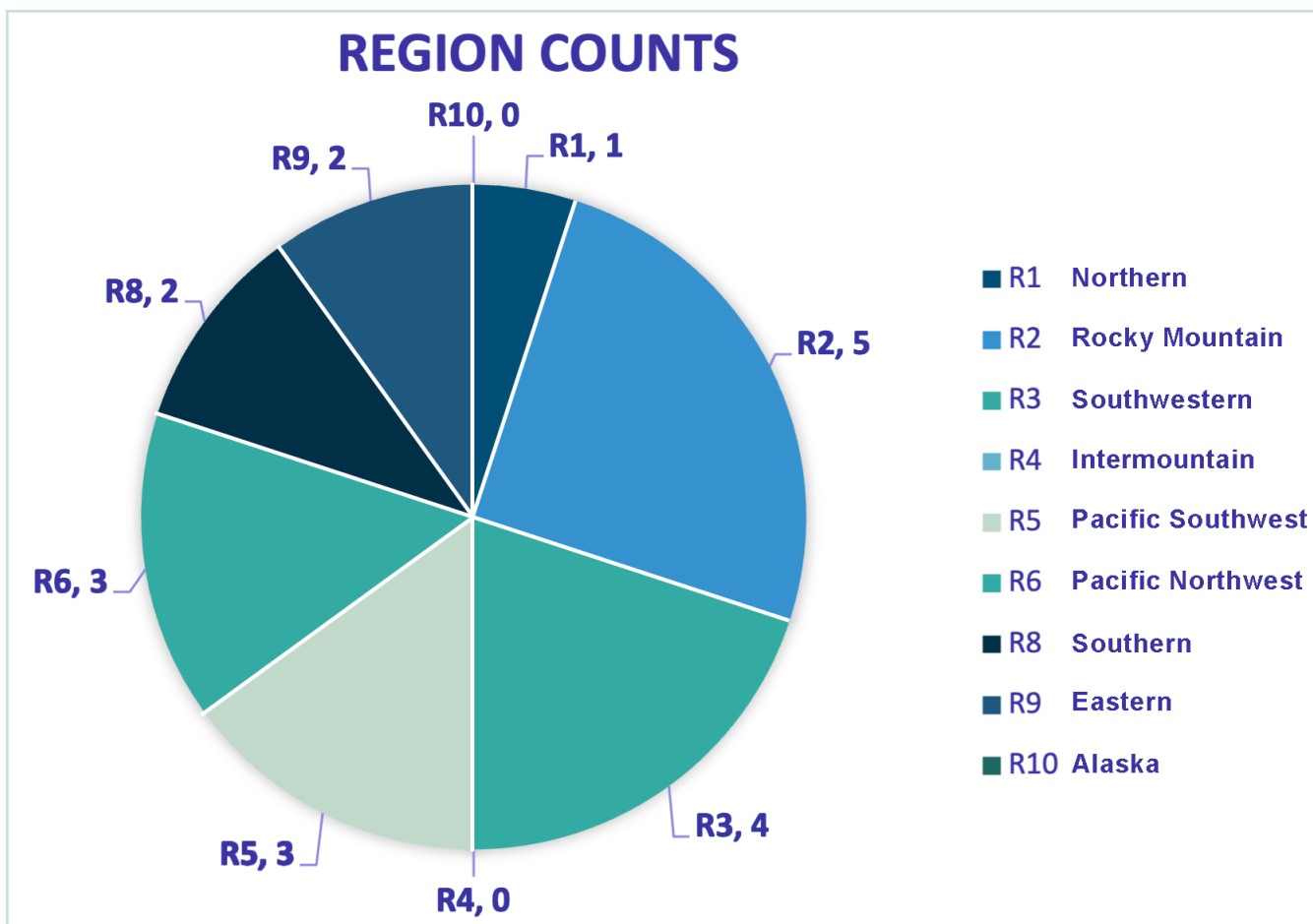


Figure 1—Number of interviewees who have worked in a particular Forest Service region [region, count].

The semi-structured interviews consisted of nine, open-ended interview questions related to experiences with the wildland fire catering system during incident response. Using open-ended questions allowed research participants to move across questions and seamlessly provide additional context to explain their varied experiences. The semi-structured approach also allowed researchers to follow-up with probing questions to expand on how participants made meaning of events.

Data Analysis

Microsoft Teams transcripts were used to collect the qualitative data. As this is an exploratory study, we adopted a grounded theoretical approach (Strauss and Corbin 1997) without any commitment to a theoretical framework or hypothesis (as recommended by Strauss and Corbin 1997). After reviewing transcripts, we began the process of identifying themes that emerged from the data. While we discovered several topics for further research during our analysis, we did not identify them as themes unless they emerged as pivotal topics across research participants. We then defined each emergent theme and began the process of drafting how themes related to each other and identified patterns of understandings among research participants. What follows are the dominant themes that emerged across research participants based on their experiences and perceptions of the wildland fire meal catering system.

Findings

Perceptions of Food Quality

A dominant theme that emerged throughout the interview process is for much-needed improvement in the meal catering system. Overall, perceptions of meals were defined as “nutritionally inadequate” (WLFF #3). Nonetheless, perceptions also varied as participants cited breakfast as “adequate” (WLFF #5) with typical breakfast foods such as eggs (liquid), sausages, and a fruit bowl. At times there is also a snack table where WLFF can grab food to take with them. Lunch was perceived as the “worst meal of the day,” (WLFF #3) in terms of quality and taste, and usually a monotonous “rinse and repeat” (WLFF #3) process. Lunch normally consists of a sandwich with a slice of processed deli meat between two slices of “low-quality bread” (WLFF #4), candy bar, granola bar, nuts, and fruit or vegetables, which “may be inedible for it being unripe or moldy” (WLFF #4). Lunch was also perceived as the greatest source of waste because sack lunches typically consist of items that WLFFs do not want. Similar to breakfast, dinner was perceived as “adequate” (WLFF #5) in terms of taste and variety, although participants cited concern about excessive carbohydrates due to pastas typically being served as the main dish. At times, dinner included a salad bar where dessert options are also available. During the COVID-19 pandemic, dinner was served in sealed packs, and the salad bar was removed to avoid contamination, but catering has most recently returned to the pre-pandemic open salad bar.

While participants cited the importance of a salad bar for meeting proper nutrition intake, their overarching concern was the high levels of carbohydrates and sugar consumption throughout the day mainly provided in the sack lunch. Participants desired less sugary and more whole carbohydrates and a greater variety of fats and omega-type fatty acids.



Figure 2—Firefighters eating breakfast provided by catering services at the Badger Spike Camp, 2018 Furguson Fire, Sierra National Forest, California. USDA Forest Service photo by Kari Greer.

Dietary Choices During an Incident Response

Our analysis revealed that in terms of dietary choices during a wildfire response, some respondents stated that they often resort to what they call putting themselves on a “fire season diet” (WLFF #1) where, despite the large portions of food available, they will “only eat what is absolutely necessary” (WLFF #1) to maintain energy intake during an incident. Participants state that they will tailor their own diets by selecting available options with an awareness toward potential negative impacts on health and performance due to the large amount of carbohydrates and sugar options. One interview respondent went as far as to say that during an incident, WLFFs “normalize things that they would not accept in their day-to-day (e.g., chips, bars, pastas), in their daily life... that’s a big component of why people do not take as good care of themselves, specifically with what they are consuming” (WLFF #6). For instance, when selecting what to consume during an incident, some WLFFs selected vegetarian lunches even if they were not vegetarian. Vegetarian lunches were perceived as healthier and less of a “rinse and repeat” (WLFF #3), offering a greater variety of lunch items than non-vegetarian lunches.

Morale and Autonomy

In addition to catered meals serving as basic sources of energy, each meal of the day also has a less frequently mentioned social-psychological function. Whereas breakfast and lunch were perceived as necessary for maintaining a high level of performance, dinner is perceived as a time to boost morale after an arduous workday. One participant

reported that when he arrives to base camp, he often first inquires as to who is the caterer. He reports that if they had a positive previous experience with the caterer, morale tends to improve; on the other hand, negative previous experiences could lower morale even before crews are sent out to the fireline. Other participants in this study also reported that prison crew catering is often perceived as the most desirable because they offer higher quality food. When a prison crew is assigned to catering, participants in this study report that morale tends to increase upon arrival to an incident. Thus, in terms of overall morale, the WLFFs also perceived that crew productivity and willingness to perform tasks increased when fire crews ate well. Moreover, interviewees reported that when there is an increase in morale a supervisor can spend more time focused on tactics and less time and energy working on motivating their crew.

The WLFFs in this study argue that they enjoy as much autonomy in their dietary choices as possible. The availability of a salad bar with multiple vegetable options, bins for building their own meals, or receiving per diem reportedly added to the autonomy of WLFFs nutritional choices during an incident. Participants also reported an admiration for the Canadian “build your own lunch” (WLFF #1) catering system, which provides greater food options and the autonomy to select from a more varied menu with healthier nutritional options to create their own meals.

Spike Camps and Social Media

Other topics that emerged during interviews that may not initially come to mind when considering WLFF meal catering are the perceived benefits of spike camps and the role of social media. Spike camps were expanded during the COVID-19 pandemic to minimize virus spread, keep WLFFs healthy, and allow them to camp closer to the fireline without needing to drive long-distances back to base camp each evening. When WLFFs are in a remote spike camp they are provided bins or send a vehicle to pick up meals for the rest of the crew. While spike camps sometimes limit food options, participants in this study report that they are able build their own nutritional meals using the meal provisions sent to them. They also report being able to rest for longer periods of time because they do not need to drive back to base camp, and nights are quieter in spike camps.

Social media also played a role in the catering system when WLFFs shared comments and images of catered food. In some instances, especially when there was a great amount of disappointment about the catering, interviewees stated that pictures and comments on WLFF-related social media sites led to WLFFs having a greater voice in influencing food quality. For example, social media posts that include images of and comments about poor-quality catered meals at base camp can often lead the food unit leader to address the issue directly with the catering company.



Figure 3—A tent city in a wildfire base camp during the 2018 Taylor Creek Fire. The Incident Command Post was near Rogue River-Siskiyou National Forest, Oregon. USDA Forest Service photo by Cecilio Ricardo.

Summary

Overall, participants reported various opportunities to improve the wildland fire catering system for incident response. The WLFFs in this study report that they often make nutritional choices on an incident that they would not normally make in their daily lives. Lunch was widely perceived by participants as the “worst meal of the day” (WLFF #3) and as negatively impacting health, performance, alertness, safety, and morale. Obtaining more autonomy and greater variation in healthy food options that contain more protein and omega-3 fatty acids are more desirable than carbohydrates and highly processed sugar. High quality, healthy food options also reportedly increase morale and work productivity on the fireline, allowing supervisors to focus more on strategy, tactics, and risk rather than employee morale and behavior.

Discussion

During a wildfire incident, WLFFs are sent to work in highly complex environments and often work 16-hour days for up to 14–21 days at a time. Proper nutrition is essential for maintaining a high level of production, situational awareness, and making critical risk-based decisions during an incident (Brooks et al. 2021; Coker et al. 2019; Cuddy et al. 2007; Ruby et al. 2023). However, the best available science identifies that current

consumption patterns among WLFFs may not deliver the adequate nutrients for the demands of the job (Marks et al. 2020). The national catering contract provides requirements only for the minimum calories required and not a total, nutrition-based caloric value (National Geographic Area Coordination Center n.d.; National Interagency Fire Center 2004). Therefore, there may be a gap in the number of nutritional calories that are needed versus the amount of minimum calories recommended to national catering contractors, leaving much room for underdelivering and potentially under nourishing WLFFs.

Simply increasing the number of calories offered by catering contractors on an incident will not solve catering challenges. The WLFFs in this study, along with recommendations from Brooks et al. 2021, argue for greater nutrition education during mealtimes due to the array of physical requirements for the different occupational roles that are filled during a wildfire incident response. For example, WLFFs work in occupations that range from physically active duties on the fireline to sedentary administrative work where duties are performed solely within a base camp. Second, WLFFs range in age, height, weight, and caloric intake required to maintain proper mental and physical fitness. Third, WLFFs as well as the food industry have an increased awareness of multiple dietary restrictions that need to be considered.

Interview participants argue that nutritional information needs to be science-based and focused on meal portion sizes that range from low–medium–high for different levels of physically active occupations during an incident response. In addition, the WLFFs stated that they desired meals that are of greater nutritional value and higher in proteins and Omega-3 fatty acids rather than current meals that are reportedly high in carbohydrates and sugars. There was a desire for catered meals that contain foods with greater nutrient values to provide them with the energy they need to maintain a high level of performance throughout an incident response. Finally, we argue for the development of a national social science-based study on catering that includes surveys, interviews, focus groups, and content analysis, along with professional nutritionists and employees who are charged with managing the national catering contract.

Assessment Limitations

This exploratory study includes in-depth interviews with seven participants who work in U.S. Forest Service wildland fire operations. The seven participants in this study have several years of experience and have worked on many incidents, and importantly, they were able to provide appropriate, rich data. However, the participants may not fully represent all the perspectives of WLFFs across the agency. Because the U.S. Forest Service employs over 11,000 WLFFs nationwide (USDA FS 2024) and wildland fire demands an interagency response, additional qualitative investigation, along with a supplementary quantitative study, is warranted.

Moreover, study participants are now working in more sedentary management positions and their occupational roles during wildfire incidents are no longer solely in arduous occupations that require higher caloric intake during response. Moreover, the participants in this study do not have dietary restrictions such as allergies or intolerances; therefore, WLFFs with dietary restrictions are not represented in the

findings. We also suggest that future studies include surveys and interviews with caterers and food unit leaders to capture barriers in providing healthy meal options during incident response.

Conclusion

This exploratory study aims to identify WLFF perceptions of the nutritional importance of meal catering during wildland fire response. Using qualitative in-depth interviews of WLFFs who have worked on wildland fire incidents since the 1990s and early 2000s, we identified patterned responses about meal catering across interviewees. Participants identified the following key perceptions: (1) food quality as nutritionally inadequate, (2) limited dietary choices during incident response, (3) varied impacts on morale, and (4) a desire for greater autonomy when selecting meal options. Other topics that emerged include the benefits of spike camps and the role of social media to communicate about catering services. Maintaining proper nutrition and caloric intake during a wildland fire incident has implications for maintaining situational awareness and risk-based decision-making. This exploratory research calls for a national social science-based study informed by nutritional science that examines WLFF perceptions of incident meal catering and the organization of the incident catering process.

References

- Belval, E.J.; Bayham, J.; Magstadt, S. 2024. Retention of highly qualified wildland firefighters in the Western United States. *Forest Policy and Economics*. 158: 103115. <https://doi.org/10.1016/j.forpol.2023.103115>
- Brooks, S.J.; West, M.R.; Domitrovich, J.W.; [et al.]. 2021. Nutrient intake of wildland firefighters during arduous wildfire suppression: Macronutrient and micronutrient consumption. *Journal of Occupational and Environmental Medicine*. 63(12): e949-e956. <https://doi.org/10.1097/jom.0000000000002413>
- Coker, R.H.; Murphy, C.J.; Johannsen, M.; [et al.] 2019. Wildland firefighting: Adverse influence on indices of metabolic and cardiovascular health. *Journal of Occupational and Environmental Medicine*. 61(3): e91-e94. <https://doi.org/10.1097/jom.0000000000001535>
- Cuddy, J.S.; Gaskill, S.E.; Sharkey, B.J.; [et al.]. Supplemental feedings increase self-selected work output during wildfire suppression. *Medicine & Science in Sports & Exercise*. 39(6): 1004–1012. <https://doi.org/10.1249/mss.0b013e318040b2fb>
- Emerson, M.E.; Fretz, R.I; Shaw, L.L. 1995. *Writing ethnographic field notes*. Chicago, IL: University of Chicago Press. 254 p. <https://press.uchicago.edu/ucp/books/book/chicago/W/bo12182616.html>
- Flores, D.; Haire, E.R. 2022. The U.S. Forest Service Life First safety initiative: Exploring unnecessary exposure to risk. *International Journal of Wildland Fire*. 31(10): 927-935. <https://doi.org/10.1071/WF21099>
- Granberg, R.M.; Pearson, S.; Verble, R.M [Project Team]. Survey of federal wildland firefighters: Working conditions, safety, morale, & barriers to recruitment & retention. Page last modified 1 June 2022. https://drive.google.com/file/d/12WozvjGHR1Bt9gsmq_QraqAAJhAD_W03/view [Accessed 21 February 2025]
- Granberg, R.M.; Shen, T.; Pearson, S.W.; [et al.]. 2023. Occupational and environmental factors influencing morale of United States federal wildland firefighters. *International Journal of Wildland Fire*. 32(12). https://drive.google.com/file/d/12WozvjGHR1Bt9gsmq_QraqAAJhAD_W03/view [Accessed 21 February 2025]
- Jenner, S.L.; Buckley, G.L.; Belski, R.; [et al.]. 2019. Dietary intakes of professional and semi-professional team sport athletes do not meet sport nutrition recommendations—a systematic literature review. *Nutrients*. 11(5): 1160. <https://doi.org/10.3390/nu11051160>
- Klossner, T.M.; Drescher, M.J.; Games, K.E. 2024. Attitudes and beliefs of wildland firefighters toward occupational health services. *Journal of Occupational and Environmental Medicine*. 66(1): e8-e16. <https://doi.org/10.1097/jom.0000000000002986>

- Marks, A.N.; Sol, J.A.; Domitrovich, J.W.; [et al.]. 2020. Total energy intake and self-selected macronutrient distribution during wildland fire suppression. *Wilderness and Environmental Medicine*. 31(2). <https://doi.org/10.1016/j.wem.2020.01.009>
- National Geographic Area Coordination Center. 2004. Fire complexity analysis [Chapter 5]. In: Agency administrators guide for wildland fire decision making. Albuquerque, NM: Southwest Coordination Center. n.p. https://gacc.nifc.gov/swcc/management_admin/Agency_Administrator/AA_Guidelines/pdf_files/ch5.pdf [Accessed 21 February 2025]
- National Geographic Area Coordination Center and National Interagency Fire Center. n.d. National mobile food services. https://www.fs.usda.gov/sites/default/files/2020-07/2020-2024%20Food%20Services%20Contract-Generic_0.pdf [Accessed 21 February 2025]
- Ruby, B.; Coker, R.; Sol, J.; [et al.]. 2023. Physiology of the wildland firefighter: Managing extreme energy demands in hostile, smoky, mountainous environments. *Comprehensive Physiology*. 13. <https://doi.org/10.1002/cphy.c220016>
- Strauss, A.L.; Corbin, J.M. 1997. Grounded theory in practice. Thousand Oaks, California: Sage Publishing. 288 p. <https://us.sagepub.com/en-us/nam/grounded-theory-in-practice/book6165> [Accessed 16 June 2025]
- U.S. Department of Agriculture, Forest Service [USDA FS]. 2023a. Interagency hotshot crews. Washington, DC: U.S. Department of Agriculture, Forest Service. <https://www.fs.usda.gov/science-technology/fire/people/hotshots> [Accessed 21 February 2025]
- U.S. Department of Agriculture, Forest Service [USDA FS]. 2023b. Interagency hotshot crews. Programmatic review. FS-1215. Page last modified September 2023. Washington, DC: U.S. Department of Agriculture, Forest Service. 74 p. https://www.fs.usda.gov/sites/default/files/fs_media/fs_document/ihc-program-review.pdf [Page last modified September 2023]
- U.S. Department of Agriculture, Forest Service [USDA FS]. n.d. Wildland firefighting workforce. <https://www.fs.usda.gov/managing-land/fire/workforce> [Accessed 21 February 2025]
- Wagner, S.L.; White, N.; Krutop, E. 2025. Mental health risk for wildland firefighters: A review and future directions. *International Journal of Wildland Fire*. 34(1). <https://doi.org/10.1071/WF24159>
- Weiss, R.S. 1995. Learning from strangers: The art and method of qualitative interview studies. New York: Simon and Schuster. 256 p. <https://www.simonandschuster.com/books/Learning-From-Strangers/Robert-S-Weiss/9780684823126> [Accessed 16 June 2025]

In accordance with Federal civil rights law and U.S. Department of Agriculture (USDA) civil rights regulations and policies, the USDA, its Agencies, offices, and employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

Persons with disabilities who require alternative means of communication for program information (e.g., Braille, large print, audiotape, American Sign Language, etc.) should contact the State or local Agency that administers the program or contact USDA through the Telecommunications Relay Service at 711 (voice and TTY). Additionally, program information may be made available in languages other than English.

To file a program discrimination complaint, complete the USDA Program Discrimination Complaint Form, AD-3027, found online at [How to File a Program Discrimination Complaint](#) and at any USDA office or write a letter addressed to USDA and provide in the letter all of the information requested in the form. To request a copy of the complaint form, call (866) 632-9992. Submit your completed form or letter to USDA by: (1) mail: U.S. Department of Agriculture, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue, SW, Mail Stop 9410, Washington, D.C. 20250-9410; (2) fax: (202) 690-7442; or (3) email: program.intake@usda.gov.

USDA is an equal opportunity provider, employer, and lender.



To learn more about RMRS publications or search our online titles:

<https://research.fs.usda.gov/rmrs/products/publications>

<https://research.fs.usda.gov/treesearch>