

U.S. Fire Administration/National Fire Data Center

Structure Cooking Fires

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Findings

- Cooking is the leading cause of fires and fire injuries in structures. Deaths and property losses due to cooking, however, are among the lowest.
- In 2002, cooking fires and injuries peaked at 6 p.m.—the dinner hour. There was a slight decrease in cooking fires in the summer when more outdoor barbecuing and family vacationing occur.
- The leading type of material ignited in cooking fires is food, especially fats, oils, and grease.
- Cooking left unattended is the leading factor contributing to cooking fires.
- A smoke alarm was present and alerted the occupants in 45% of cooking fires.

Fires attributable to cooking equipment have long been one of the leading causes of structure fires. With the decline in fires caused by heating in the 1980s and early 1990s and the steady level of cooking-related fires, cooking has become the leading cause of structure fires. This topical report examines the characteristics of structure cooking fires as derived from currently available 2002 NFIRS data. In 2002 alone, cooking-related fires caused an estimated 185,600 fires in structures, 80 deaths, 3,875 injuries, and \$481 million in property damage.^{1, 2, 3}

LOSS ESTIMATES AND MEASURES

Cooking fires are characterized by very low loss rates for deaths and dollar loss and moderate loss rates for injuries (Figure 1). Their impact comes from the sheer number of fires experienced each year. As Figure 2 indicates, cooking fires accounted for 36% of reported structure fires in 2002. While the large majority of these fires (94%) are small and result primarily in injuries, their collective effects result in more structure fire injuries than any other cause.⁴

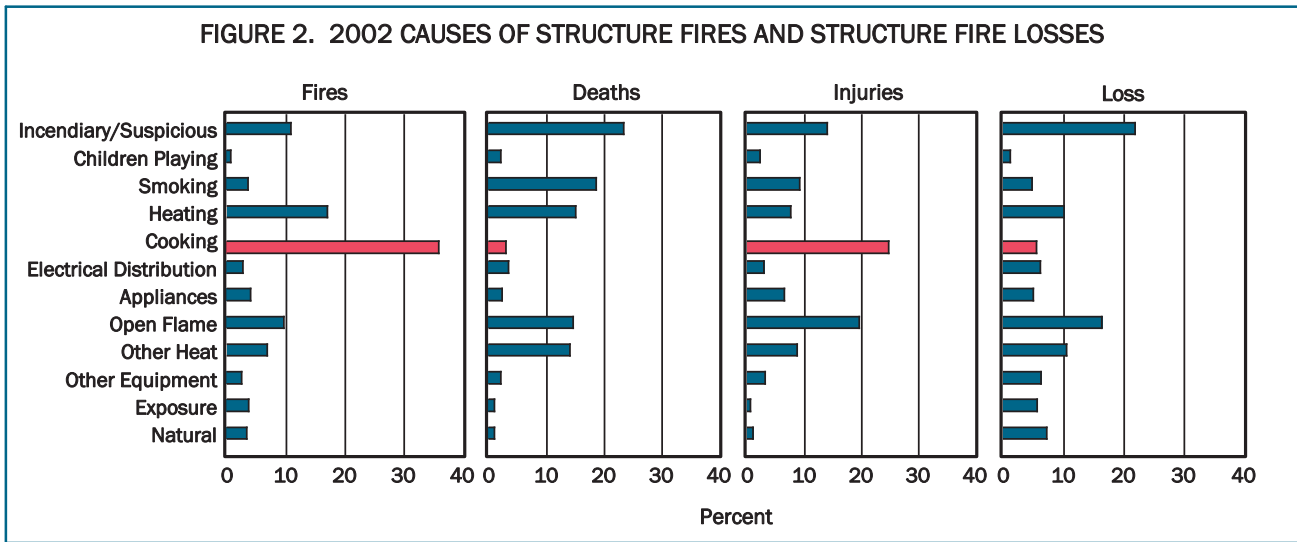
The property loss value for all structure fires per fire was \$14,252 in 2002. For cooking fires, the losses were small by comparison at \$1,573 per fire. And, for the vast majority of cooking fires—the small fires that primarily damage the cooking pot or equipment—the damage is even smaller at just \$51 per fire.⁵

FIGURE 1. 2002 LOSS MEASURES FOR COOKING FIRES

Loss Measure	All Structure Fires	All Cooking Fires	Confined Cooking Fires
\$ Loss/Fire	\$14,252	\$1,573	\$51
Injuries/1,000 Fires	30.5	20.5	10.2
Fatalities/1,000 Fires	5.1	0.3	0.0

Note: No deaths were reported to NFIRS in the no property loss confined fires in 2002.

Source: NFIRS 5.0, 2002 data



Source: NFIRS 5.0, 2002 data

WHERE FIRES OCCUR

Although cooking fires occur in many property types, the overwhelming majority of them take place in residential structures. Over 80% of cooking fires occur either in one- and two-family dwellings or in multifamily buildings such as apartments (Figure 3).

FIGURE 3. 2002 COOKING FIRES BY PROPERTY TYPE

Property Use	Percent of Fires
1- and 2-Family Dwellings	46.9
Multifamily Dwellings	33.6
Other Residential Dwellings	6.8
Restaurants, Bars, Other Eating or Drinking Places	3.5
24-Hour Care Nursing Homes	1.1
All Other Properties	8.1
Total	100.0

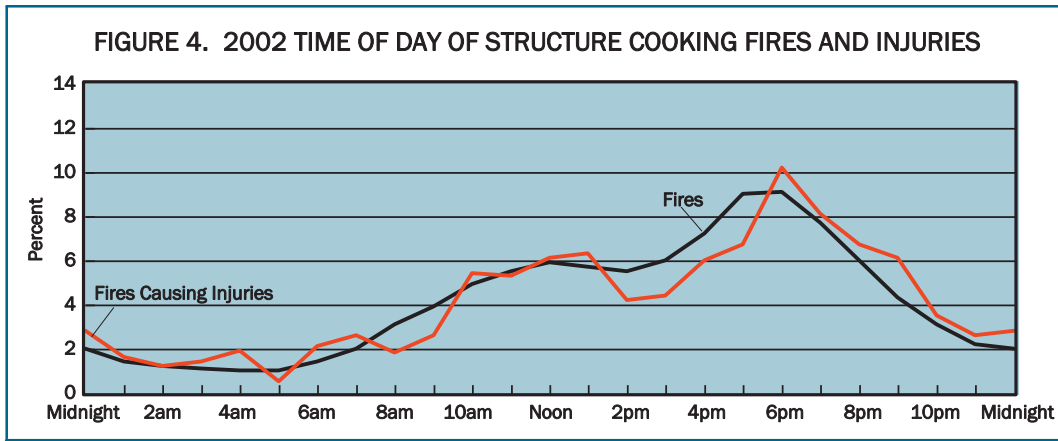
Source: NFIRS 5.0, 2002 data

WHEN FIRES OCCUR

Cooking fires follow no seasonal or monthly trend; they occurred steadily throughout 2002, with a slight decrease in the summer months. This slight decrease might be explained by a decrease in indoor cooking during the summer as outdoor barbecuing and vacationing increase.

Cooking fires do follow a daily pattern. When analyzed by time of day, a noticeable peak in kitchen fires occurred in the 6 p.m. hour, as shown in Figure 4. A secondary peak occurs at noon. The fact that the highest percentage of fires occur during the hours when many people prepare lunch or dinner is not surprising. The fires are least prevalent in the late night/early morning hours, when people are asleep.

Cooking fires that result in injuries follow the same general trend—peaking at dinnertime with a smaller peak at lunchtime. This pattern is wholly expected as cooking by its nature involves both the individual and the heat source.



MATERIAL IGNITED

Cooking materials, including food, were the material first ignited. Specifically, oil, fat, and grease were the leading types of material ignited in cooking fires (41%). This is not surprising as oil and grease are highly flammable and can splatter or spill during cooking. Other foods or starches were the second most common material ignited (21%), followed by plastics (10%) such as appliance casings or cooking utensils.

FACTORS CONTRIBUTING TO IGNITION

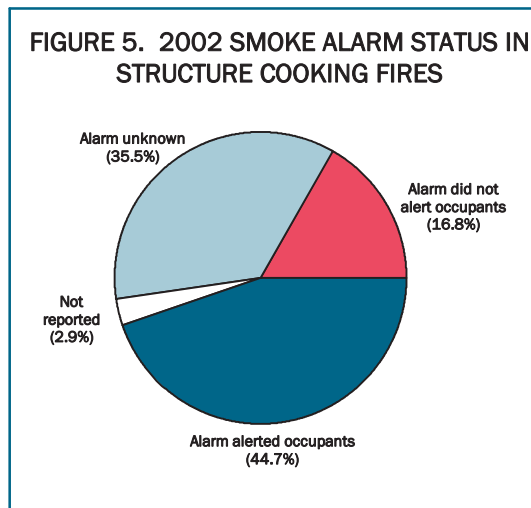
Careless cooking activities are typically responsible for cooking fires. When a factor was noted as contributing to the ignition of the fire, unattended equipment, such as people leaving food in the oven or on the stove and forgetting about it, accounted for 30% of cooking fires. Misuse of material or product and having the heat source too close to combustibles (an inherent part of cooking) each accounted for 9% of structure cooking fires. Abandoned or discarded materials or products accounted for an additional 8%.

EQUIPMENT INVOLVED IN IGNITION

The equipment involved in a cooking fire is most often the range—59% of all cooking fires. Taken together the range, oven, and microwave account for 76% of the equipment involved in cooking fires.

SMOKE ALARM PRESENCE AND OPERATION

In 45% of all structure cooking fires, a smoke alarm was present, operated, and alerted the occupants as illustrated in Figure 5. An alarm did not alert the occupants in 17% of cooking fires. The fact that alarms functioned properly and alerted the occupants may partly explain the lower rates of death and property loss in cooking. In 38% of structure cooking fire incidents, however, the status of the alarm was either unknown or not reported. Among structure fires generally, an alarm was present and operated in 34% of fires in 2002, and no alarm was present in 48% of incidents.



EXAMPLES

- April 2004: A fire started by unattended cooking resulted in severe damage to a house in Goldsboro, NC. A 13-year old boy put food on the stove to cook, then left the home. He returned later to find the house on fire.⁶
- February 2005: In Randolph, VT, a resident of a 48-unit apartment building left food on the stove to cook while he left his apartment for a short time. The fire was extinguished, but one whole floor was filled with smoke. There were no injuries.⁷
- May 2005: Cooking oil left to heat unattended on a stovetop caused a lethal fire in Syracuse, NY. A three-year-old child perished in the blaze.⁸

CONCLUSION

Cooking fires are preventable. Several straightforward and easily implemented steps can be taken by individuals to prevent cooking-related fires and to protect themselves from injury should a cooking fire occur. First, care should be taken when cooking with oil, butter, or other greasy foods that are highly flammable and can easily splatter or spill from pots and pans. Cooking aids are available to limit grease splattering. Do not attempt to extinguish grease-based fires with water as it reacts violently when poured on hot grease or oil. Small grease fires can be extinguished by placing a cover on the pan or smothering the fire with baking soda. Alcohol, such as wine and liquor, used in food preparation is extremely flammable. Loose fitting, long-sleeved clothing should not be worn while cooking, as the cloth may ignite and potentially cause serious injuries.

The leading ignition factor in kitchen fires, unattended equipment, should serve as a reminder to keep an eye on cooking materials at all times. Be cautious when leaving cooking materials for any period of time, such as answering the telephone or talking with others. By simply double-checking that all dials on stoves and ovens are off when cooking activities have ended, many fires can be prevented.

Fire extinguishers should be within easy reach of cooks. Many cooking fires occur under normal cooking conditions and cannot be anticipated. The use of extinguishers can prevent small fires from spreading and are especially effective on those fires, such as grease fires that cannot be easily extinguished by water.

Finally, all homeowners and renters should ensure that smoke alarms are installed and are operating properly. Smoke alarms are an inexpensive and effective way of detecting fires before they get out of control.

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Notes:

1. Loss estimates are based on 2002 National Fire Incident Reporting System (NFIRS) data and national structure fire loss estimates from the National Fire Protection Association's (NFPA's) *Fire Loss in the United States During 2002*. All structure fires coded as cooking fires were considered in making these loss estimates.
2. Distribution statistics are based on data from the NFIRS 2002. At the time of this report, NFIRS continues to transition from version 4.1 to 5.0. Due to issues related to accurately converting version 4.1 data to version 5.0, this report is based on data reported only in version 5.0.
3. Fire loss estimates are rounded as follows: fires to the nearest 100 fires, injuries to the nearest 25 injuries, deaths to the nearest 5 deaths, and dollar loss to the nearest \$million.
4. These small fires include cooking fires coded as "confined" incidents regardless of loss and fires coded with flame spread coded as "confined to object of origin."
5. Loss statistics for confined fires are limited to those confined fires (incident types 113–118) with only contents loss. These fires account for 84% of all cooking fires and about 90% of small cooking fires as defined in the footnote above.
6. Jack Stephens, "House Fire Started by Child Cooking," *Goldsboro News-Argus*, April 2, 2004, http://www.newsargus.com/news/archives/2004/04/02/house_fire_started_by_child_cooking.
7. "Smoke from Cooking Fire Empties Randolph House," *The Herald of Randolph, VT*, February 10, 2005, http://www.rherald.com/news/2005/0210/Community_News/com03.html.
8. Cammi Clark, "Cooking Oil Started Fatal Fire," *The Post-Standard*, May 10, 2005, <http://syracuse.com/news/poststandard/index.ssf?/base/policeblotter-0/11157144981>.