

Survey of Internal Temperatures of Lebanese Domestic Refrigerators and Analysis of Factors Affecting Them

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Lebanon is currently suffering the worst electrical power crisis in its history, which is negatively affecting the internal temperatures in domestic refrigerators and putting the Lebanese population at a higher risk of food poisoning. A survey was carried out from February to November 2013 and internal temperatures were recorded at the middle of refrigerator compartment using a data logger. In addition, socio-economic status of the households, conditions of the refrigerators and the power supply were analyzed. A short questionnaire was administered to participants, enabling the following information to be obtained: characteristics of the family, characteristics of the power supply, characteristics of the refrigerator and the use conditions. One hundred and forty-seven domestic refrigerators were surveyed in the three main cities (Beirut, Tripoli and Saida) every 5 min over a period of 72 hours. The age of 30% of the surveyed fridges exceeded 13 years, 26% were fully loaded, 16% had bad door seals, 100% did not have an internal thermometer, 20% had a heat source less than one meter close and 79% of participants reported that their refrigerator is not always connected to power. The temperatures of the surveyed refrigerators were: average 8.0°C, minimum -5.9°C and maximum 37.0°C. A significant proportion (71%) of the refrigerators had a mean temperature >6°C. Statistical analysis showed that there was no significant ($P > 0.05$) difference between mean temperatures in refrigerators in the three locations. The socio-economic status of the households (income and number of family members), the refrigerator status (age, brand name, load level and seal status) and the power supply characteristics (frequency of governmental power cuts and availability of alternative power) had a significant ($P < 0.05$) effect on internal temperature distribution of the refrigerators. The temperature data collected by this survey can indicate the amount of time that refrigerators have an internal temperature above a minimum bacterial growth temperature. In addition, these data can assist with food safety promotion and act as an input into food safety risk assessments.