



Case report

Journal of Food Safety and Hygiene

Journal homepage: <http://jfsht.tums.ac.ir>



License obligation for bread safety and business and the effect of bakeries using oven under the building in earthquake damages: a case of February 2023 earthquakes, Türkiye

Sibel Özçakmak^{1*}, Ebrahim Molae-Aghae², Hüseyin Yıldız³

¹Provincial Directorate of Agriculture and Livestock, Ministry of Agriculture and Forestry, Samsun, Türkiye.

²Division of Food Safety & Hygiene, Department of Environmental Health Engineering, School of Public Health, Tehran University of Medical Sciences, Tehran, Iran.

³Provincial Directorate of Agriculture and Livestock, Ministry of Agriculture and Forestry, Aydın, Türkiye.

ARTICLE INFO

Article history:

Received 30 Jul. 2023

Received in revised form

19 Sep. 2023

Accepted 28 Sep. 2023

Keywords:

Bread;

Bakery;

Building damage;

Regulations;

Stove oven

ABSTRACT

Food and water supply is important for people's health affected by earthquakes. Food manufacturing areas must be built earthquake-resistant and in accordance with the conditions specified in the legal legislation to provide food security and safety through disasters. A bread and bread varieties business using ovens could be damaged and pose a risk to their neighborhood due to their activities. Production of bread and bread varieties using stone/wood ovens could cause the separation of iron from concrete with the effect of warming and cooling. This study aimed to evaluate the impact of bread and bread varieties businesses located at the entrances of the apartments on the destruction or damage of buildings caused by earthquakes and lack of access to enough safe food. Therefore, the damage to buildings with stone/wood ovens at apartment entrances caused by the earthquake that occurred in Türkiye on 6 February 2023 was evaluated. Some bread producers with ovens that have no independent structures and obtained licenses before the regulation dated 2014, should determine their infrastructural features. Using stove/wood ovens under or at the entrance of the apartments in bakery places could be a risk of causing damage to the column structure. The inspections of bakery places of the municipality and the other authorized organizations must be done more often, and official monitoring should be mandatory for food and environmental safety.

Citation: Özçakmak S, Molae-Aghae E, Yıldız H. License obligation for bread safety and business and the effect of bakeries using oven under the building in earthquake damages: a case of February 2023 earthquakes, Türkiye. J food safe & hyg 2023; 9(3): 207-216

1. Introduction

With the "Regulation on Opening and Operating Licenses of the Workplaces" first published in 2005 (1), the procedures and principles regarding the

licensing and inspection of sanitary and non-sanitary workplaces and public rest and entertainment places were determined. Licensing and Inspection Directorates of Metropolitan Municipalities are authorized to issue licenses to these businesses (2).

*Corresponding author. Tel.: +90 362 437 0077

E-mail address: sibel.ozcakmak@tarimorman.gov.tr



Copyright © 2023 Tehran University of Medical Sciences. Published by Tehran University of Medical Sciences.

This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International license (<https://creativecommons.org/licenses/by-nc/4.0/>).

Non-commercial uses of the work are permitted, provided the original work is properly cited.

Among the duties of the Directorates of Metropolitan Municipalities are to examine the applications made by the food business before they were established, to examine them on site, to ensure that the activities of non-sanitary establishments that do not comply with the license conditions and do not take the necessary precautions are to be stopped, and to carry out the necessary procedures for the cancellation of their licenses (3).

With the amendment made in the Regulation on "Opening and Operating Licenses of the Workplaces" in 2014, it has been made obligatory for bread producers using stone/wood ovens to be operated in independent buildings that are in a separate arrangement. There should be no house adjacent to or above the buildings to be used as a bakery operation. In this amendment, bakeries within the scope of workplaces opened with names such as hypermarkets, supermarkets, gross markets, and mega markets with an area of 1000 m² and above are excluded (4).

Non-sanitary businesses are workplaces that cause physical, mental, chemical, microbiological, and social harm to their environment and pollute natural resources.

Bread-producing bakeries are the status of workplaces that require a special structure, and if they go into operation without meeting the necessary criteria, they pose a great danger in terms of both human health and environmental safety. If a bakery-producing place is suitable for Good Hygiene Practices, safe bakery products could be produced. If the layout plan and size of the bakery businesses are suitable, a business and working license and food activity permit are issued (4, 5,6).

In regions affected by earthquakes, there are problems in meeting the need for enough safe bread due to the damage or complete collapse of bakeries especially using stone/wood ovens that are not separate parcels or under house. Due to the magnitude of the earthquake disaster, buildings and facilities of food supply and distribution centers were also damaged, and some were thoroughly destroyed which took time to organize and operate the damaged centers (8).

The Iranian Red Crescent Society (IRCS) neither is responsible for, nor an expert in, building codes and regulations, however, it could take part in disaster risk assessment, identifying areas where earthquake risk and poor housing construction are noticeable, educating these communities to reduce the risk, and helping for the safer building to be constructed (9). On February 22, 2005, another earthquake measuring 6.4 on the Richter scale hit Zarand, north of Kerman province, Iran. Reconstruction approaches caused the displacement of many people and forced migration to the selected sites and with the same adverse effects on food facilities (10).

People living in the earthquake area need mostly safety water, food, and medicine. If bread producers using stone/wood ovens are placed under a house or not separated from any parcel, the possibility of destruction is high. In this way, bread, one of the basic nutritional ingredients, could not be available in abundance in the disaster area (5-7).

This study aimed to investigate the effect of stone/wood ovens used for producing bread on buildings and evaluate the current legal regulations for producing bread and bread varieties and the relationship between damage risk and bread producers

using ovens under the apartment to supply enough safe food in disasters.

2. Case presentation

Türkiye has experienced great destruction caused by earthquakes in the past years. The last earthquakes were on 6 February 2023, with the epicenters in Pazarcık/Kahramanmaraş (Mw 7.7; focal depth: 8.6 km) and Elbistan (Mw 7.6; focal depth: 7 km) districts of Kahramanmaraş, at 04:17 and 13:24 local time, respectively (7). During this study, damaged and/or collapsed buildings that had wood ovens (black ovens, stone ovens) for producing bread in Adana, Adıyaman, Elazığ, Diyarbakır, Gaziantep, Hatay, Kahramanmaraş, Kilis, Malatya, Osmaniye and Şanlıurfa after the 6 February 2023 earthquakes in Türkiye were investigated. For this aim, it was applied to the Republic of Türkiye Directorate of Communications (CIMER) used the Right to Information on 09.03.2023 and asked "Whether there is a license from the municipality in the business operating in bakery producing bread and bread products, whether or not there is any risk of collapse before the earthquake, although there is an "Opening and Operating Licenses of the Workplaces License" whether there are bakeries for bread production although it is not legally allowed to operate under the dwellings. The answers were obtained between 14.04.2023 and 09.06.2023, as primary sources, compiled from national and international publications constituted the secondary sources of the study. Then, the findings were processed, categorized and compared.

2.1. Official institutions to obtain information

In areas exposed to the earthquake in Türkiye on 6th Feb 2023, the major official institutions were addressed to gather information. The answers were obtained between 14.04.2023 and 16.05.2023 (Table 1).

2.2. Data obtained by some relevant authorities

The answers given by the relevant authorities in line with the application made to the Presidency Communication Center regarding the situation of being under the residence in case of damage to the buildings in the earthquake are presented in Table 2.

Table 1. Obtained Data from Answered Official Institutions

Date	Name of the Official Institutions
14.04.2023	Diyarbakir Provincial Directorate of Trade
18.04.2023	Kilis Municipality, Gaziantep
02.05.2023	Yavuzeli Municipality, Gaziantep
20.04.2023	Şehitkamil Municipality, Gaziantep
24.04.2023	Karkamış Municipality, Gaziantep
27.04.2023	Karkamış District Directorate of Agriculture and Forestry
02.05.2023	Oğuzeli Municipality
28.04.2023	Onikişubat Municipality, Municipal Police
04.05.2023	Seyhan Municipality, Department of Licensing and Inspection
03.05.2023	Elazığ Metropolitan Municipality, Municipal Police
08.05.2023	Araban Municipality
16.05.2023	Hatay Metropolitan Municipality
09.06.2023	Malatya Büyükşehir Belediye Başkanlığı

Table 2. Data obtained by some relevant authorities about heavily damaged/destroyed buildings under stone ovens affected by the 6 February 2023 earthquake

The name of relevant authorities	Answers
<i>Onikişubat Municipality,</i> Municipal Police, Kahramanmaraş	In our district, there is a one franca factory under the house and the building of which was destroyed. It has been determined that there have been still two franca factory under the house and there are nine workplaces. Although they have not "Workplace Opening and Working License" for "businesses producing bread, bread varieties, there are nine bread and bread varieties producers. All these workplaces are licensed by our municipality, and some of them have been producing bread and bread varieties in order to meet the bread needs caused by the earthquake.
Karkamış Municipality, Directorate of Development and Urbanization of Municipality, District Government Office, Department of Planning and Construction and Karkamış Provincial Directorate of Agriculture and Livestock, Gaziantep	According to our investigation, there is no franca factory under heavily damaged buildings, the bakery places have "Workplace Opening and Working License" for "businesses producing bread, bread varieties and they are no risk of collapse, there are two pita ovens and franca factory. It was found that one of the pita ovens and franca factories are established under the house.
Kilis Metropolitan Municipality	The Municipality reported that there are no bakeries producing bread under destroyed and/or severely damaged buildings affected by the earthquakes, bakery producers had "Working Opening and Working License" for "businesses producing bread and bread varieties by the municipality.
Oğuzeli Municipality, Gaziantep	It has been reported that there are no buildings that are heavily damaged or destroyed within the boundaries of the municipality, all bakeries in the district are "Working Opening and Working Licensed".
Seyhan Municipality, Department of Building Licence and Audit, Adana	It has been reported that it would be appropriate to request the works subject to the Environment and Urbanization Provincial Directorate.
<i>Diyarbakır Provincial Directorate of Trade</i>	It has been reported that the relevant issue is not within the jurisdiction.
<i>Yavuzeli Municipality, Gaziantep</i>	There are no enterprises producing bread in damaged buildings, the enterprises that operate the bakery have licenses received from the municipality, and there is no risk of collapse in the buildings where the operating enterprises are located. It has been reported that there is bread production using stone ovens that were licensed before the regulation and are currently operating with their previous licenses.
<i>Araban Municipality, Gaziantep</i>	Bread-producing businesses were licensed by the municipality, and it was reported that there were no stone ovens with any risk of destruction before the earthquake, and they were legally permitted before 2014 years under the house.

Elazığ Metropolitan Municipality, The participation of the District Police Department	There were no stone ovens producing bread under the buildings destroyed or heavily damaged in Elazığ province, the bakery companies were issued by the Municipality, and there was no risk of demolition.
<i>Hatay Metropolitan Municipality</i>	In article 7 of the Metropolitan Municipality Law No. 5216, there is a Paragraph (c) titled "Duties and powers of district municipalities". According to the provision, bread-producing businesses are licensed and audited by the Metropolitan Municipality.
<i>Malatya Metropolitan Municipality</i>	There is one catering and bread factory to be licensed and there are no buildings that are heavily damaged.

3. Discussion

3.1. Regulation for opening and working licenses for bread-producing businesses

The permission for bread and bread varieties production is the responsibility of the District Municipalities according to the Metropolitan Municipality Law No. 5216 on Opening and Operating Licenses of the Workplaces (3). A food business is obliged to provide and verify the conditions set out in Law No.5996 on Veterinary Services, Plant Health, Food, and Feed at every stage of its process.

The Regulation on the Registration and Approval Procedures of the Business was prepared based on Articles 22 (Responsibilities), 30 (Registration and Approval of Business), and 31 (Official controls, right of objection and official certificates) specified in Law No. 5996 (11) in Turkey. With the amendment made in the Registry and Approval Regulation in 2020 (12), "Opening and Operating Licenses of the Workplaces" for "business producing bread, bread varieties, other types of bread and business producing only plain pita or making the final baking process of plain pita and/or bread" is a legal obligation.

In Iran, Standard INSO 2800 is one of the objectives of the Seismic Design Code (13). This standard includes the minimum standards and regulations for the design

and implementation of buildings against the effects of earthquakes in such a way that especially important buildings, such as hospitals, during severe earthquakes (14).

3.2. The evaluation of licensed bread and bread varieties business in Türkiye

The working license certificate given by the municipality to the food business must be suitable for their activity. For example, a business with a bakery product license cannot produce bread and bread varieties if it is under the house. According to the declarations by Istanbul Provincial Directorate of Agriculture and Forestry (15), Sarıhan (2021) (16) and Anonymous (2022b) (17), 300 out of 30 thousand small and medium-sized bakeries producing bread and bread varieties in İstanbul, 70 out of 750 bakeries in Bursa and 111 out of 260 bakeries in Antalya produce without an opening and working license for open and work business, respectively.

In a field study carried out by the Istanbul Chamber of Commerce (ICOC) in 2019, it was reported that 63.5 % of the participating companies had bread-producing permits. It was determined that 22.0 % had a license for both bread and baked goods permits, 74.4 % of the participating companies operated at the entrance of apartments, only 25.6 % had independent structures,

and 79.6 % of the private companies provided service at the entrance of the apartments (18).

After the 2023 earthquake, it was stated that the unlicensed bread producers should be closed immediately, and the buildings with existing licenses should be checked. The geophysical experts emphasized that the stone/wood oven's temperature would affect the concrete quality of the building and, for these reasons facilitate the demolition of the building (20-23).

In the earthquake-affected provinces, some of the workplaces damaged, demolished, or requiring urgent demolition were food businesses and some of the damaged buildings were bread bakery businesses (20, 22, 23). In a research assessment in earthquake-affected regions, it was declared that the resistance of buildings that were under or at the entrance of an apartment was weaker than others (16). In the wake of the earthquake, the Union of Chambers of Turkish Engineers, and Architects (UCTEA) have alerted that Municipalities are responsible for providing building licenses, according to the regulation on the opening and working licenses for non-sanitary business. UCTEA explained that stone/wood ovens especially under or the entrance sections of the apartments could damage the building structure, the carrier systems such as columns and beams cause heat change, and expansion in the concrete due to the heat emitted, so it would increase the risk of damage, UCTEA suggested that bakery businesses should be detached units and inspected much more frequently (24).

There were bread production places using stone ovens that were licensed before the regulation and are currently operating with their previous licenses. In

addition, although some of the bakeries didn't have "Workplace Opening and Operating Licenses for "businesses producing bread, and bread varieties, there were some bread and bread varieties producers under the building which was destroyed (25).

3.3. The effect of using black/stone ovens by bread producers under the buildings

Although the types of ovens used by businesses vary, black ovens or stone ovens are used the most. Due to the high heat emitted by these furnaces, the building concrete becomes easily broken. Although it is against the legislation that the workplaces, which are not considered bread ovens in the workplace project, operate without isolation and reinforcement, it poses a great danger in an earthquake (26-28).

Regarding the Opening and Operating Licenses of the workplace legislation changes after 2014, the establishment of bread ovens in residential areas has been prevented. This situation can lead to plaster cracks and spills in the building where the businesses producing in multi-stored sub-dwelling buildings are located. When stone kilns that produce heat are used, they cause expansion of the concrete and flexing in the columns over time, as they cause moisture (29).

Doğan (2009) reported that cooking units, called brick kilns or black kilns, are among the heavy tonnage fixtures and adversely affect the static structure of the building. When a heating bread process produced by ovens is called stone or black oven, cooking is generally done within wood or fuel oil fire. Stone ovens that produce high heat under the apartment damage the building, as they cause moisture, expand over concrete over time and stretch in columns (30). The changes in high temperature and moisture would be caused by fire

cause of the physical-mechanical properties of building stones. When exposed to fire, natural stones can suffer from irreversible changes in microstructure and mechanical properties. These disorders may compromise the structural integrity and increase the risk of instability of the entire building (21).

The heat exchange of the furnaces under the apartment damages the carrier systems of the building and makes the concrete of the building easily breakable, which is expressed as "brittle concrete danger" (30-32). These inconveniences, which cause the expansion of the concrete on the floor where the furnaces are located, cause the brittle structure in the concrete structure, and the flexing of the carrier columns, reduce the strength of the buildings, especially in areas with earthquake risk, and can cause heavy damage or major destruction in the buildings (26,33,34).

4. Conclusion

The legislative amendment made in 2014 regarding the bakery business, which prohibits the construction of bread ovens under residential buildings, is of great importance in terms of food and environmental safety. Buildings with an oven do not have a reinforced concrete system that will not miss the heat, causing the furnaces to damage the building during the earthquake. Opening and working of bakery business places with stone/wood must be in non-detached buildings. Licensed enterprises of bread production must do the necessary analysis regarding the soundness of the buildings due to their food and environmental responsibility. Corrosion formation in buildings in areas at risk of earthquakes increases the seismic force that the structure will be exposed to in the earthquake. To take

necessary preventive measures, especially heat and moisture insulation against the weaknesses that pose a risk due to mold and corrosion and increase the inspections and controls by the authorized institutions, thereby the damages of possible earthquake disasters will be reduced effectively. It is a critical point that establish food businesses that are resistant to possible earthquake hazards to provide basic food needs like bread for the affected people's health in the disaster area. Countries like Türkiye and Iran are seismically highly active countries, and the design and implementation of buildings, and workplaces' structural design and carrier systems in accordance with legal provisions must be provided regularly against the effects of earthquakes.

Conflict of interest

The authors declare that there is no conflict of interest.

Acknowledgment

The authors are grateful for the aid of the construction engineers and management consultants Burc Ersoy, Dr. Yunus Emrahan Akbulut, and machine engineer Murat Temel.

References

1. Anonymous. 14.7.2005 tarih ve 2005/9207 Karar Sayılı "İşyeri Açma ve Çalışma Ruhsatlarına İlişkin Yönetmelik". Available at: <https://www.resmigazete.gov.tr/eskiler/2005/08/20050810-4.htm>. Cited January 21, 2022.
2. Anonymous. 10.07.2004 tarih ve 5216 Kanun Numaralı Büyükşehir Belediyesi Kanunu. Available at:

- <https://www.mevzuat.gov.tr/mevzuat?MevzuatNo=5216&MevzuatTur=1&MevzuatTertip=5>. Cited May 10, 2023.
3. Anonymous. İstanbul Büyükşehir Belediyesi Zabıta Daire Başkanlığı Rusat ve Denetim Şube Müdürlüğü Görev ve Çalışma Yönetmeliği. Available at: <https://zabita.ibb.istanbul/uploads/2018/08/Ruhsat-ve-Denetim-sube-Mudurlugu-Gorev-ve-calisma-Yonetmeliği-12-2015.pdf>. Cited April 02, 2023.
 4. Anonymous. 26 Kasım 2014 tarih ve 2014/7002 Karar Sayılı “İşyeri Açma ve Çalışma Ruhsatlarına İlişkin Yönetmelikte Değişiklik Yapılmasına Dair Yönetmelik”. Available at: <https://www.resmigazete.gov.tr/eskiler/2014/11/20141126-14.htm>. Cited June 11, 2017.
 5. Anonymous. Tarım ve Orman Bakanlığı. Fırın ve pastane mamulleri üretimi için İyi Hijyen Uygulamaları Rehberi. Available at: https://www.tarimorman.gov.tr/GKGM/Belgeler/Uretici_Bilgi_Kosesi/Egitim/Hijyen_Kilavuz/F%C4%B1r%C4%B1nc%C4%B1l%C4%B1k%20ve%20pastana%20Mamulleri%20%C3%9Cretimi%20%C4%B0%C3%A7in.pdf. Cited September 19, 2020.
 6. Gündüzöz İ. Sorulu ve Cevaplı İşyeri Açma ve Çalışma Ruhsatı. *Türkiye Belediyeler Birliği*, Baskı Yeri Lazer Ofset Matbaa Tes.San. ve Tic.Ltd.Şti. ISBN: 978-975-6311-14-1. Available at: https://www.tbb.gov.tr/online/yayinlar/isyeri_Acma_ve_Calisma_Ruhsati/files/publication.pdf. Cited April 10, 2023.
 7. AFAD. 06 Şubat 2023 Pazarcık (Kahramanmaraş) Mw 7.7 Elbistan (Kahramanmaraş) Mw 7.6 Depremlerine İlişkin Ön Değerlendirme Raporu. Available at: https://deprem.afad.gov.tr/assets/pdf/Kahramanmaraş%20Depremleri_%20On%20Degerlendirme%20Raporu.pdf. Cited July 10, 2023.
 8. Jahed Khaniki GH, Mahvi A. Evaluation of the health status of food preparation and distribution centers in Bam city after the earthquake. *Environ Sci Technol* 2006; 85: 59-67.
 9. Chomilier BE, Lawry-White H, Pelly S, et al. Operations review of the Red Cross, Red Crescent movement response to the earthquake in Bam, Iran. International Federation of Red Cross and Red Crescent Societies, Available at: <https://reliefweb.int/report/iran-islamic-republic/operations-review-red-cross-red-crescent-movement-response-earthquake>. Cited June 11, 2023.
 10. Shojaei A, Fallahi A. Forced Displacement Following Reconstruction Approaches After 2005 Zarand Earthquake, Iran. *Rebuilding Communities After Displacement*. Chapter: 129, p1416.
 11. Anonymous. Veteriner Hizmetleri, Bitki Sağlığı, Gıda ve Yem Kanunu. 1st Ed: Sidas MedyaEditor: Neriman BAGDATLIOGLUISBN: 978-605-5267-96-4 Available at: <https://www.mevzuat.gov.tr/mevzuatmetin/1.5.5996.pdf> Cited November 12, 2017.
 12. Anonymous. Gıda İşletmelerinin Kayıt ve Onay İşlemlerine Dair Yönetmelikte Değişiklik Yapılması Hakkında Yönetmelik.2 Nisan 2020 tarih ve 31087 sayılı Resmi Gazete. Available at: <https://www.resmigazete.gov.tr/eskiler/2020/04/20200402-15.htm>. Cited August 17, 2021.
 13. Regulations for Sismic Design. Iranian Code of Practice for Seismic Resistant Design of Buildings, Standard No. 2800. Iran National Standards Organizations. 4th Ed: Published in 2015; ISBN: 978-600-113-128-8.
 14. Mahmoudi SM, Ghobadi A. Seismic design of very high importance buildings regulations using standard 2800: Critical Review (Technical Note). *Int J Civil Engin* 2011; 45: 365-69.
 15. Anonymous. İstanbul İl Tarım ve Orman Müdürlüğü. "İstanbul'un kanayan yarası ruhsatsız fırınlar". Available at: <https://www.dunya.com/ekonomi/firincilarin->

- sorunlari-istanbul-ticaret-borsasinda-gorusuldu-haberi-675069. Cited April 16, 2022.
16. Sarıhan AZ. İstanbul Ekmek Üreticileri Derneği (EKÜDER) Başkanı Ahmet Zeki Sarıhan: “EKÜDER toplantısında zincir marketler ve ruhsatsız fırınlar tartışıldı”. Available at: <https://www.ekmeginsesi.com/gundem/ekuder-toplantısında-zincir-marketler-ve-ruhsatsız-fırınlar-tartisildi-h2050.html>. Cited June 15, 2022.
17. Anonymous. “Borsa Meydanı'nda Sektörler Konuşuyor”. Available at: <https://www.dunya.com/ekonomi/firincilarin-sorunlari-istanbul-ticaret-borsasinda-gorusuldu-haberi-675069>. Cited May 21, 2022.
18. Azabağaoğlu ÖM, Unakıtan G. İstanbul'da Ekmekçilik sektörü, sorunlar ve çözüm önerileri. Sektörel etütler ve araştırmalar. İstanbul Ticaret Odası ve İstanbul Düşünce Akademisi, Yayın No: 2018-3, İstanbul.
19. Balcı Hİ. Gıda Vizyonu: Başta İstanbul olmak üzere ruhsatsız fırınlar acilen kapatılmalı. Available at: <http://www.gidavizyon.com/basta-istanbul-olmak-uzere-ruhsatsız-fırınlar-acilen-kapatilmali/>. Cited April 4, 2023.
20. Ercan ÖA. Övgün Ahmet Ercan'dan Uyarı: Apartman altı fırınlar tehlike oluşturuyor. <https://www.cumhuriyet.com.tr/turkiye/prof-dr-ovgun-ahmet-ercandan-uyari-apartman-alti-fırınlar-tehlike-olusturuyor-2055479>. Cited April 09, 2023.
21. Vigroux M, Eslami J, Beaucour AL, et al. Experimental investigation on physico-mechanical properties of natural building stones exposed to high temperature. SMAR 2019, Fifth Conference on Smart Monitoring, Assessment and Rehabilitation Civil Structures, Available at: <http://www.ndt.net/?id=24867>. Cited February 10, 2022.
22. Kaya H. Bina altlarındaki fırınlar depremde büyük risk. Available at: <https://www.elazigfirat.com/bina-altlarındaki-fırınlar-depremde-buyuk-risk>. Cited March 19, 2023.
23. Özer F. Fırıncılar Odası Başkanı: Altında fırın olan binalarda acilen güçlendirme yapılmalı. Available at: <https://t24.com.tr/haber/altında-fırın-olan-binalarda-acilen-guclendirme-yapilmali,204061>. Cited May 16, 2012.
24. UCTEA. Union of Chambers of Turkish Engineers and Architects. Available at: <https://www.gazeteduvar.com.tr/uzmanlardan-istanbullulara-bina-altındaki-fırın-pizzacı-ve-marketler-icin-uyari-galeri-1605626>. Cited March 13, 2023.
25. CIMER, 2023. T.C. Cumhurbaşkanlığı İletişim Başkanlığı Bilgi Edinme Başvurusu. The reports made by *Onikişubat Municipality*, Karkamış Municipality, Şehitkamil Municipality, Kilis Metropolitan Municipality, Oğuzeli Municipality, Seyhan Municipality, *Diyarbakır Provincial Directorate of Trade*, Yavuzeli Municipality, Malatya Metropolitan Municipality, Hatay Metropolitan Municipality, 2023.
26. Ozguven A, Ozcelik Y. Investigation of some property changes of natural building stones exposed to fire and high heat. *Construct Building Material* 2013; 38: 813-21.
27. Gündoğdu O. Jeofizik Uzmanı Dr. Oğuz Gündoğdu: Bina altı fırınlar depremde faciaya davetiye çıkarıyor. Available at: <https://www.takvim.com.tr/guncel/2019/08/19/bina-alti-fırınlar-depremde-faciaya-davetiye-cikariyor>. Cited August 19, 2019.
28. Gökçe C. İnşaat Mühendisleri Odası Genel Başkanı. "Eski Binalar Risk Altında". Available at: <https://www.milliyet.com.tr/gundem/bina-alti-sicak-tehlike-6018876>. Cited August 19, 2019.
29. TBF. Türkiye Bakery Federation, 2011. “İşyeri Açma ve Çalışma Ruhsatı” konulu e-bülten. Available at: <https://firincilarfederasyonu.org/mevzuat/yararli-bilgi/unlu-mamul-ruhsati-bulunanların-ekmek-uretememesi-hk..html>. Cited November 06, 2015.

30. Doğan M. Betonarme yapılarıdaki Deprem Hasarlarına Korozyonun Etkisi. Eskişehir Osmangazi Üniversitesi Mühendislik Mimarlık Fakültesi Dergisi 2009; 12: 147-68.
31. Kocaman C, Bayülke N, Doğan A, et al. 19 Mayıs 2011 Simav Depremi ve Yapı Hasarı Raporu. Available at: <https://hatay.imo.org.tr/Eklenti/640,imo-afet-mudahale-hazirlik-kurulu-heyeti-tarafindan-hazirlanan-19-mayis-2011-simav-dep> Seismic resistant design of buildings.
32. Biber TE. Karadeniz’de depremler ve yardımlar (1939-1944). Marmara Türkiyat Araştırmaları Dergisi 2019; 6: 151-81.
33. Koç V. Deprem öncesi ve sonrası gözlenen beton ve donatı korozyonları ile kısa kolon hasarlarının incelenmesi. Europ J Sci Technol 2016; 4: 8-20.
34. Ozguven A, Ozcelik Y. Effects of high temperature on physical-mechanical properties of Turkish natural building stones. J Engin Geol 2014; 183: 127-36.