Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

Professional Medical Opinion

Health risks – damage to the urological system, bladder cancer and impaired fertility, exposure to fried foods fried in oil that have been reused, often for several days in the same oil, and the innovative solution to reduce morbidity caused by this exposure through the use of Beyond Oil technology

Details of my professional training:

- I graduated from the Technion Medical School Haifa with honors in 1993.
- Licensed to practice medicine number 25915 since 1994.
- Specialization in Urological Surgery at Bnei Zion Medical Center, managed by Prof. Ofer Nativ. I holds a specialist license in Urological Surgery No. 18215, since 2000.
- Postdoctoral internship in molecular biology of urological diseases supervised by Prof. Mark Schonberg, Brady Urological Institute, Johns Hopkins Hospital, Johns Hopkins University, Baltimore, USA, 1996-1997.
- Subspecialty in Pediatric Urological Surgery, Toronto Children's Hospital, including the Pediatric Spinal Malformation Rehabilitation Program, Bloor View Ontario National Center, supervised by Prof. Tony Khoury, University of Toronto, Toronto, Ontario, Canada, 2001-2003.
- Full Professorate the Rappaport Faculty of Medicine, Technion, Israel Institute of Technology, Haifa. Most of my research concerns malignancies in the urological system, especially bladder cancer. Engaged in active molecular research in early detection and finding drug treatment for bladder cancer.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

- Outgoing Chairman: The Society of Paediatric Urology in Israel, frequently participates in urology and paediatric urology conferences, and is a member of the Israeli Urological Association.
- Member of the committee for determining eligibility for surgery abroad for children suffering from birth defects on behalf of the Ministry of Health.
- Head of the Urology Department and Pediatric Urologist, Bnei Zion Medical Center in Haifa, 2024.

I was asked by the company, Beyond Oil, to provide an opinion based on the global medical literature on the association between eating fried food and occupational exposure, which takes place in kitchens in the restaurant industry and frying factories, to oil fumes from continuous frying and repeated in the same oil many times over several days, as occurs in fryers in institutional and industrial kitchens and morbidity in the urological system. Comparatively, I will demonstrate the difference in exposure to toxic substances and in reducing morbidity with the use of the Beyond Oil technology.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

Summary

Global problem: Global Health Risks- Effect of Eating industrialized fried foods on Consumers and kitchen workers:

The secret that the food and restaurant industries are forced to hide from the public is the "secret of returning oil" in the frying oil so it can be reused for hundreds of frying cycles for several days with the same oil. The practice is rooted deep in the global food industry, and takes place in the kitchens of restaurants, hotels, catering services, Banquet Halls and fried food establishments. The recurring oil is also rooted in many types of nutrition and diets in the world, as the food industry and the restaurant industry have succeeded in producing fried food adapted to any diet.

There was no comprehensive solution to this problem until now, because if the oil were changed every time they fry fresh batches of food - as in home use or even once a day, the price of food would rise unreasonably.

Extensive studies in the medical and scientific literature, health authorities in America and Europe, and various legislative authorities, prove the direct connection between eating fried food fried "in the return oil", which includes an average of 20% of the oil and inhaling oil vapor during the process, as well as severe morbidity, including the development of characteristic cancers.

The contribution of the global frying industry to the morbidity and mortality of consumers worldwide.

The biggest secret in the world of industrial frying, which meets us in most industrialized foods, is worse than frying in the restaurant industry, it turns out that some factories use the same oil for hundreds of frying between 3-10 days and finally throw it away. **On the other hand, global frying companies with dozens of frying plants around the world have developed a practice of not throwing oil at all**. Even after many days of frying in the same oil, instead of throwing away the burnt oil with the carcinogenic products, transfer it for filling tank "TOP UP" and automatically pour

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

into the fryers with the new oil, in a measured manner between 5-10 percent at a time, and sometimes this action is hidden from the frying line workers, so that the oil with carcinogenic toxins mixes with the new oil and is transferred directly to the fried food, which absorbs between 15-30 percent of the oil on average.

This is the contribution of the global frying industry to consumer morbidity and mortality worldwide.

Repeated use of frying oil causes an increase in the release of toxins into both the air and fried foods. The rate of toxic emissions increases as oil reuse continues.

Who is affected by a re-frying problem?

This issue affects people around the world, transcending geographical and cultural boundaries. From an early age and throughout life, most of the world's population consumes fried food, widely prepared in oil from continuous frying and repeated in the same oil many times over many days. This practice occurs in various frameworks - from catering companies in kindergartens and schools, in military services, in universities and during social gatherings such as weddings. These foods are also common in hotels and restaurants, as most of the world's population buys fried food from the supermarket in the form of snacks, sweets, fried pastries and also frozen foods that were fried in the factory and heated at home, such as coated sausages, chips, chicken nuggets, onion rings, fried chicken, mozzarella sticks, spring rolls, fried calamari, schnitzels, fish and more.

Such extensive and sustained exposure to reused frying oils contributes significantly to serious health conditions such as cancer, cardiovascular disease, diabetes, lung problems and obesity, which affect people throughout their lives.

According to the World Health Organization, one in five people suffer from cancer, where reused frying oil is a significant risk factor. Repeated use of frying oil for several days leads to harmful health outcomes, including an increased incidence of certain types of cancer. Recent academic literature, along with studies by regulatory agencies, and health organizations around the world, confirm a direct link between the

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

consumption of oil absorbed in fried foods and increased cancer rates.

According to studies plural eating the oil absorbed in fried foods, or inhaling oil vapor in repeated frying, has the potential to lead to the development of various cancers and other diseases.

When we eat fried food in a restaurant/fried snack, we are actually eating between 10-30% oil that is soaked in the fried food. This oil causes cancer, cardiovascular and arterial blockages, and at the moment, there is no solution to the problem in the world. Consumers are forced to eat oil-soaked fried food that is unhealthy for them and their families.

Previous research on the innovative technology of Beyond Oil and the solution to the re-frying problem was carried out by Prof. Nissim Gerti, from Casali Institute of Applied Chemistry, Department Chemistry, The Hebrew University of Jerusalem, and Prof. Oren Fruchter, principal The Pulmonary and Respiratory Intensive Care Department, Wolfson Medical Center and the Faculty of Medicine at Tel Aviv University. **My article will deal with the effects on the urological system.**

Many studies have mapped and found the types of toxins that develop in the oil in re-frying, which are absorbed in the fried food we eat and which are emitted into the air by the frying fumes that are inhaled in high concentrations by kitchen workers in the institutional market and frying plants. These toxins cause cancer and disease in all body systems in general and in the urological system in particular. These toxins are certain to cause specific diseases: bladder cancer, chronic kidney disease, and infertility.

Both researchers and policy makers of public health and occupational health around the world have an urgent need to tackle the global problem of the use of repetitive oil as a cause of morbidity and mortality worldwide.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

Beyond Oil is a public company traded on the Canadian Securities Exchange, specializing in the field of improving the health of fried foods. After 15 years of research and development, they have developed an innovative filter powder composed of food additives, which have been cleared by the strictest regulatory bodies in the world such as: FDA, Health Canada, NSF and more. The produced is also patented in Europe, Israel and the United States. This formula effectively absorbs degradation ingredients from fried oil, slows down the rate of deterioration reactions, and through a filtration process which is simple and removing toxins in a way that allows oil to be reused for many days while reducing the health risk to zero levels. The solution of Beyond Oil represents significant global progress in maintaining the health of diners and restaurant kitchen workers and frying plants reusing the same oil over an extended period.

The toxic substances emitted when re-frying in cooking oil

Repeated frying in the same oil hundreds of times for a number of days, as occurs in restaurant kitchens, hotels, banquet halls, frying plants, causes a massive emission of concentrated oil vapor. The concentration and composition of the steam varies according to the frying method, the type of fried food, and according to the type of oil. In general, many carcinogenic frying oil are emitted during cooking, such as:

- Polycyclic aromatic hydrocarbons (PAH)
- Heterocyclic aromatic amines, Benzene, and Formaldehyde

Below are tables that demonstrate the emission levels of aromatic amines according to the type of food:

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

Table 1.2. The production rates and concentrations of UFP and $PM_{2.5}$ during and at the end of frying of various types of foods

Food	Food temperature (°C)[a]	Production rate during frying		Concentration at the end of frying	
		UFP (particles/cm^3 s)	$PM_{2.5}$ (μg/m^3 s)	UFP (particles/cm^3)	$PM_{2.5}$ (μg/m^3)
Bacon	314	45	0.092	$2.2*10^4$	38
Pancakes	297	25	0.17	$2.5*10^4$	55
Peppers and onions	336	78	0.12	$2.0*10^4$	60
Vegetable stir-fry	280	31	ND	$2.0*10^4$	ND
Vegetable mix	249	59	ND	$4.5*10^4$	ND
Fried egg	271	60	ND	$2.5*10^4$	ND
Fried rice	274	6	ND	$1.0*10^4$	ND
Breaded eggplant	280	88	1.1	$8.0*10^4$	1000
Overall		44	0.13		

Table 1.8. Concentrations[a] of $PM_{2.5}$, PAHs and formaldehyde in a research house during pan-frying

Type of stove Food cooked	$PM_{2.5}$ (μg/m^3)		Total PAHs (ng/m^3)		Seven PAHs[b] (ng/m^3)		Formaldehyde[c] (ppb)
	Stove	Kitchen	Indoor	Outdoor	Indoor	Outdoor	Indoor
Gas							
Hamburger	115	60	294	288	0.93	1.76	3
Steak	2270	2670	833	189	3.70	1.93	48
Electric							
Hamburger	252	160	425	251	3.59	1.68	<2
Steak	542	457	610	431	2.56	3.24	9

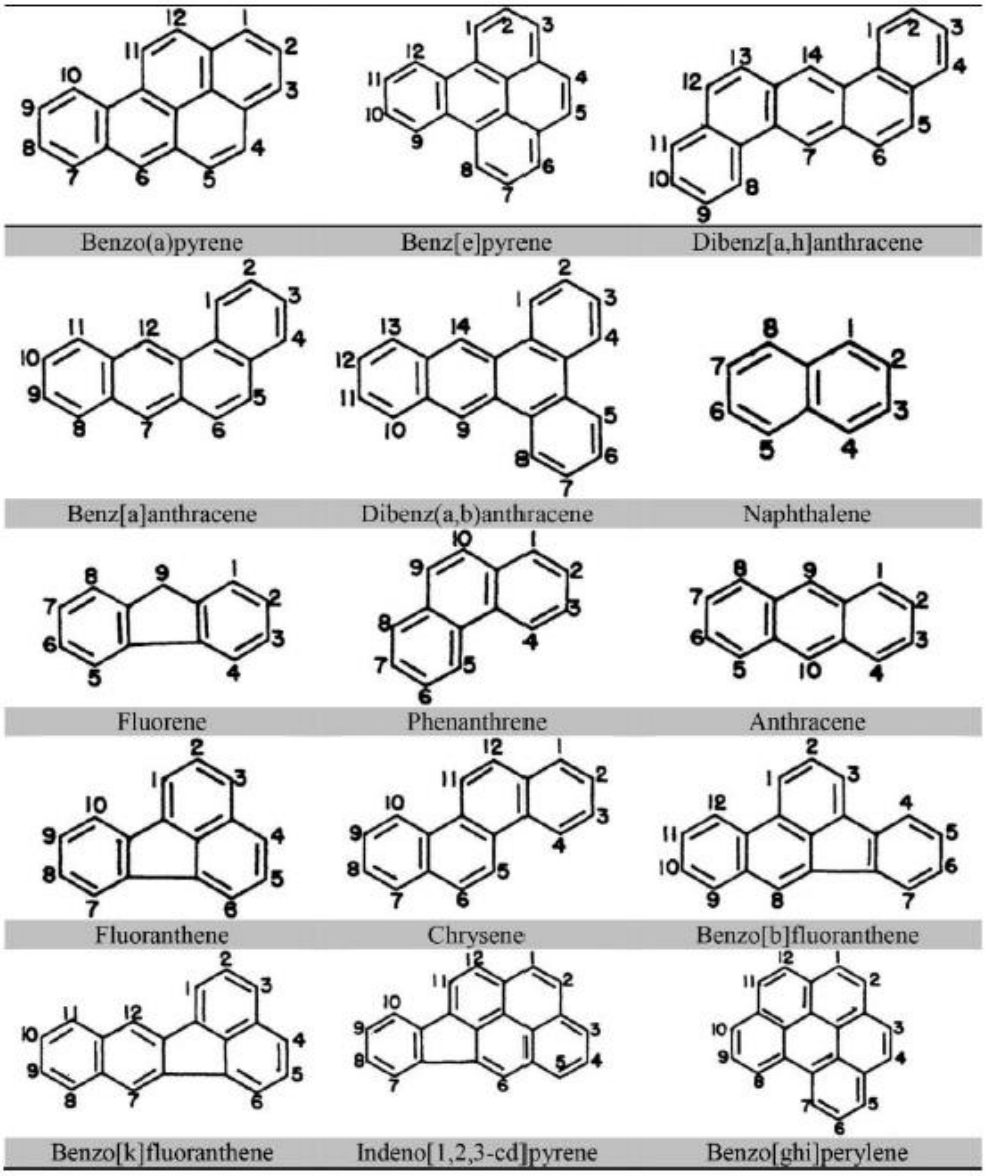
From Kelly (2001)

Chemicals	References
Acrolein, crotonaldehyde, and benzene	[17]
2-Amino-*3,8*-dimethylimidazo[*4,5*-f]quinoxaline (MeIQx)	[13]
4-Aminobiphenyl (*4*-ABP)Benzo[a]pyrene (BaP),	[11,12]
Benzo[a]anthracene (BaA),	[11,12]
Benzo[b]fluoranthene (BbFA),	[11,12]
1,3-Butadiene, benzene, acrolein, formaldehyde	[15]
Dibenz[a,h]anthracene [DBahA],	[11,12]
2-Naphthylamine (2-NA)	[8,9]

Table 1: Examples of carcinogens detected in cooking hood fumes.

Chung KT (2013) The Etiology of Bladder Cancer and its Prevention. J Cancer Sci Ther 5: 346-361. doi:10.4172/1948-5956.1000226

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il



igure 1. List of PAHs in cooking oil fumes (Li, Pan, and Wang 1992, 2003; Chen et al. 2012; Yao et al. 2015).

These toxins are harmful to those who breathe the vapors emitted during cooking, and in addition, some of them are absorbed into the prepared and served food, endangering those who eat it. Increased absorption of these toxins is associated with the development of malignant diseases in humans.

Penn et al. checked the rate of oxidative damage to DNA by urine test for 8 hydroxy 2 dioxi guanine. In fact, levels of guanine nucleic acid, which express oxidative damage due to toxin exposure, have been studied. The introductory chapter of their study notes

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

that people who are exposed to frying oil fumes are at increased risk of developing respiratory diseases, lung cancer, and bladder cancer. The frying of oil and the reuse of fried oil in restaurants causes the emission of PHA's, aromatic amines and nitro PAH. These substances penetrate the body by breathing in the continuous frying fumes during food preparation or through the digestive system when eating the fried food and cause damage to nucleic acids, proteins and fats. Oxidative reaction with guanine nucleus oxidation causes hydroxylation of the base. Since the cell activates repair mechanisms of the damaged DNA and removes the damaged bases, their level can be measured in the urine. The higher it is, the higher the DNA damage. Of course, there is a direct link between the rate of DNA damage and the development of malignant diseases.

This study examined 387 volunteers who work in Chinese restaurants where most of the cooking is done by frying using the same oil multiple times over several days. All the volunteers in the experiment did not smoke, so the changes in the tests are not related to smoking at all, but only to exposure to frying toxins emitted from oil in the repeated frying. Levels of toxins in the kitchen and restaurant air were tested. It was found that the levels of toxins in the kitchen were higher than those in the restaurant air and it was found that the levels of guanine in the urine were significantly higher in the kitchen workers than in the restaurant space workers. It was also found that women in general suffer from more oxidative stress than men in this experiment.

Pan CH et al, Effect on Chinese restaurant workers of exposure to cocking oil fumes: a cautionary note on urinary 8 hydroxy 2 deoxyguanosine. Cancer epidemiol biomarkers prev. 17, 12, 3351-7, 2008.

Over time, Li et al. examined 61 men who served as cooks in the Chinese army who were exposed to oil fumes from repeated frying in the same oil several times over several days during their work, and at the same time followed 37 men who worked as administrators in the Chinese army and were not exposed to cooking oil fumes. During the study, air samples and parts of the subjects' work environment were taken, as well as urine samples from the subjects.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

It was found that PAH levels were significantly higher in kitchens than in offices.

Table 1. Comparisons of PAHs levels (ng/m^3) in military kitchen and offices.

Compound	*Kitchens (n = 35)*			*Offices (n = 13)*			P
	Median	*Geometric mean*	*GSD*	*Median*	*Geometric mean*	*GSD*	
Pyrene[a]	1.05	2.26	11.38	0.31	0.39	6.38	0.006
BaA	0.39	0.65	8.06	0.12	0.15	1.51	0.033
BkF	0.84	1.51	5.77	0.39	0.66	5.04	0.103
BaP	1.74	3.35	7.38	0.74	1.23	6.65	0.095
BghiP	4.88	9.55	10.62	0.81	1.69	9.18	0.004
Summed 5 PAH	7.87	20.37	9.35	2.21	4.23	7.93	0.006

[a]Pyrene (Pyr), benzo(a)anthracene (BaA), benzo(k)fluoranthene (BkF), benzo(a)pyrene (BaP), and benzo(ghi)perylene (BghiP).

In the urine tests, an increase in the metabolites of the aromatic amines was found according to the degree of exposure. Kitchens recorded relatively low levels in the times before shift work compared to shift work and specifically during frying, there was a steady increase in the level of metabolites of aromatic amines in the urine.
The researchers conclude that in the kitchen that deals with frying, there is a significant increase in exposure to PAH and an increase in inhalation of PAH vapors, which is reflected in an increase in the metabolites excreted into the urine. Since there is a direct link between the rate of exposure and the damage these substances cause to the body, the researchers recommend various ways to reduce the rate of exposure among workers.

Lai CH et al. Exposure to cooking oil fumes and oxidative damage: a longitudinal study in Chinese military cooks. Journal of exposure science and environmental epidemiology, 23, 94-100, 2013.

Since it is clear that there is significant emissions of these substances during frying, their effect on the human body in general and on cancer diseases in particular was examined.

In 2014, the Chief Scientists of the Ministry of Environmental Protection and the Israeli Ministry of Health published an explanatory leaflet on polycyclic aromatic hydrocarbons (PAH's):

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

https://www.gov.il/BlobFolder/reports/environmental_pollutants/he/research_sviva_pollutants_info_PHA.pdf

The scientists explain that these substances constitute a group of 100 different chemicals created by incomplete combustion of organic substances. The main ways of exposure to these substances are, on the one hand, endanger the health of the employees of institutional kitchens and frying plants by inhaling the gases/vapors emitted from burning oils and other organic substances during frying due to the concentration of toxins accumulated in repeated and continuous frying in the same oil several times over several the other hand, harm to the health of the general population by exposure to prepared food and repeated frying. The **Ministry of Health and the Ministry of Environmental Protection state in the article that somePAH'sare known to be carcinogens, and others are suspected carcinogens**. In order to avoid exposure to these substances, scientists recommend, among other things, to avoid eating fried food, which is repeatedly fried in the same oil several times over several days (as happens around the world, in restaurants, hotels, catering and frying plants all over the world).

The Israel Cancer Association (ICA) on its website dealing with cancer and environmental factors notes that benzene is a known carcinogen and inhalation of air with the vapor of the substance is the main source of exposure to this substance.
https://www.cancer.org.il/template/default.aspx?PageId=6794&s=%D7%91%D7%98%D7%9F

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

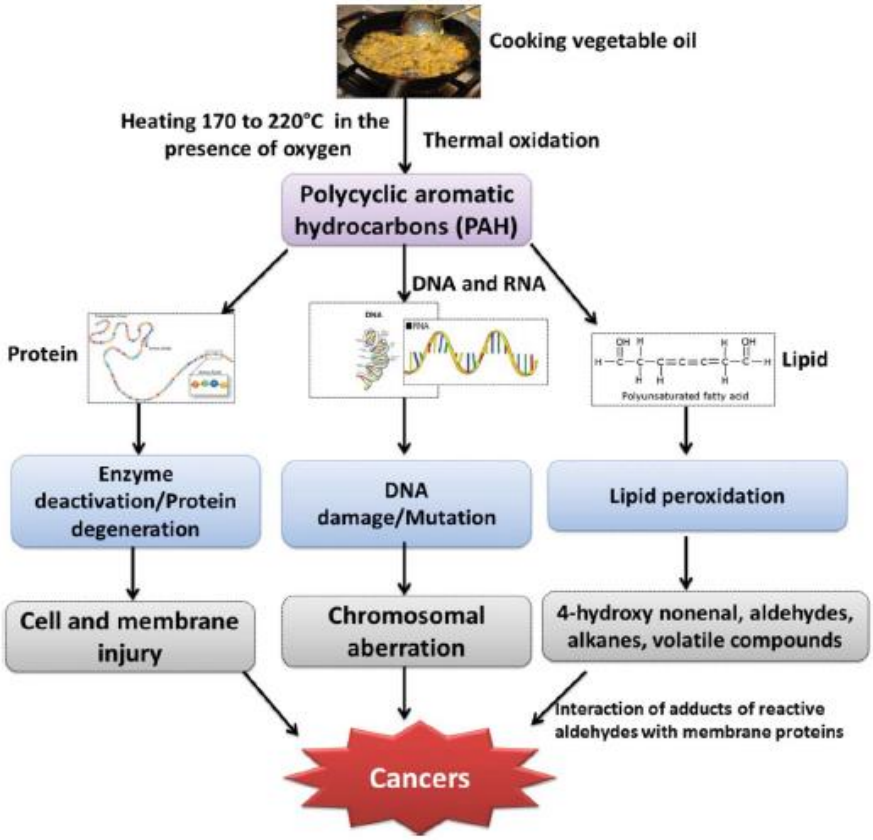
How do these substances cause damage in the human body

These substances, especially the PAHs penetrate well into the body due to their solubility in fat and their ability to penetrate the lipophilic cell membranes. The lipophilic properties allow good absorption in both the digestive and respiratory systems by inhaling vapors and after absorption there is their dispersal to the tissues of the body. The dispersion of the PAHs Depends on fatty acids bound to triacal glycerides, free cholesterol and phospholipids incorporated into the structure of chylomicrons synthesized by intestinal cells and transported by blood vessels Lymphatic Tissues.

In tissues, these toxins form bonds with nucleic acids, proteins, and fats. These connections Cause structural changes, which interfere with the normal functioning of the cell. Of the PAHs the BAP It is the most lipid-soluble. This compound can bind to lipid dispersal molecules, such as chylomicrons and other lipoproteins, and therefore penetrate several systems responsible for the absorption and dispersal of fats and, as a result, promote their biological accumulation in tissues and organs that actively participate in these processes.

These toxins cause damage to nucleic acid, proteins, and lipid metabolism. The PAHs They bind to DNA at special sites and cause errors in DNA replication and changes in DNA translation, so replication errors can cause genetic mutations and translation errors cause the creation of defective proteins. All of the above mistakes may produce oncogenes, paralyze cancer-inhibiting genes or cancer-inhibiting proteins. Binding of the toxins to cell membranes causes disruption of cell-to-cell connections in tissues, disruption of the movement of molecules in membrane channels. These disorders will eventually lead to a disruption in the regulation of cells in the tissue and an over-proliferation characteristic of malignant behavior.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il



Gensean K et al, Impact of consumption of repeatedly heated cooking oil on the incidence of various cancers a critical review. Critical reviews in food science and nutrition 2017 *http://dx.doi.org/10.1080/10408398.2017.1379470*

Aromatic amines and cancer in the urological system.

Bladder cancer is one of the most common cancers in the human body and is the fourth most common cancer in men and the eighth most common cancer in women. Bladder cancer is a sporadic and non-hereditary disease caused by environmental damage and exposure to carcinogenic substance that cause changes in the hereditary material and the onset of cancer. The main problems with bladder cancer are: 1) about 80% of those diagnosed with the disease will suffer from non-invasive cancer. This is a chronic recurrent disease that cannot be completely cured and therefore the person suffering from it must be closely monitored and invasive and unpleasant for life, 2)

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

about 10-15% of invasive cancer patients will progress and suffer from invasive cancer that requires radical treatments and causes considerable mortality. 3) Up to 20% of those suffering from the disease will suffer at the time of diagnosis from invasive cancer that will require radical surgical and chemotherapy treatments, depending on the stage of the disease the mortality rate is high.

The most important factors known to be responsible for the development of bladder cancer are exposure to carcinogenic due to smoking and exposure to carcinogenic due to occupation related to inhalation or ingestion of carcinogens, exposure to repeated frying in the same oil many times for several days and the existing problem in restaurant kitchens and frying plants.

Kuntz et al. examined 531 men and 144 women to assess occupational risk in developing bladder cancer. The researchers demonstrated an increase in bladder cancer rates in people who worked in industries emitting such carcinogenic substances such as printing workers, plastics, rubber, miners, dyes, tanners, and exposure to refrying. **The researchers conclude that there is a clear link between occupational exposure to carcinogenic and the development of bladder cancer at a high rate, and therefore the work environment should be changed and such exposure prevented.**

Kunze E, et al. Lifestyle and occupational risk factors for bladder cancer in Germany, a case controlled study. Cancer 69, 1776-1790, 1992.

Gansan et al. In a 2019 paper, they examined the effect of consuming food fried in the same oil multiple times over several days and the association with cancer in different body systems. The association with lung, breast, bowel and prostate cancers was examined. In a study involving 1,096 healthy subjects, 717 subjects with localized prostate cancer and 1,140 subjects with diffuse prostate cancer found a clear association between consumption of recurrent fried foods, and the development of prostate cancer. In addition, a clear link was found between people who consumed fish fried at high temperature and prostate cancer. Regarding the pathophysiology and causes of prostate cancer, the study notes the fact that during frying potatoes and chips, especially the return oil, there is a high emission of acrylamide, and other

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

studies have demonstrated a link between acrylamide and prostate cancer. In addition, frying at high temperature causes the emission of AGE's, which are known to trigger inflammatory processes. There are studies showing a link between inflammation and the development of prostate cancer. Frying in canola, sunflower, soy, cotton and palm oils cause the emission of omega-6 fatty acids, which are known to cause proliferation of prostate cells in cell lines. There are also studies demonstrating a link between the consumption of this substance and prostate cancer in men.

Gensean K et al, Impact of consumption of repeatedly heated cooking oil on the incidence of various cancers a critical review. Critical reviews in food science and nutrition 2017 http://dx.doi.org/10.1080/10408398.2017.1379470

Cheng et al. In an article on bladder cancer, Cheng et al. review the various factors contributing to the development of this malignancy. A chapter in the article is devoted to frying oil vapor in food that has been fried using the same oil multiple times over several days The authors note that air sampling in kitchens where there is repeated oil frying demonstrates a significant rate of the emission of toxins noted above at the beginning of the review.

Cooking fume hood: Chiang et al. [11] analyzed cooking fume samples in the kitchens of Chinese homes and found that there were mutagenic *2*-naphthylamine (*2*-NA) and *4*-aminobiphenyl (*4*-ABP), which can cause bladder cancer [9,10]. Concentrations of *2*-NA and *4*-ABP were 31.5 and 35.7 μg/m^3 in fumes from sunflower oil, 31.9 and 26.5 μg/m^3 in vegetable oil, and 48.3 and 23.3 μg/m^3 in refined oil.

Other genotoxicpolycyclic compounds such as benzo [a] pyrene (BaP), benzo[a]anthracene (BaA), dibenz(a,h) anthracene [DBahA], benzo(b)fluoranthene (BbFA), and benzo(a)pyrene [B(a)P] were detected and identified in commercial cooking oil (safflower, olive,

Chung KT (2013) The Etiology of Bladder Cancer and its Prevention. J Cancer Sci Ther 5: 346-361. doi:10.4172/1948-5956.1000226

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

The link between these toxins and bladder cancer has been proven in several studies. Colt et al. demonstrated an association between exposure to truck diesel smoke and an increase in bladder cancer rates among these workers. When it is known that the emitted smoke contains the same toxins.

Colt JS et al, occupation and bladder cancer risk in a population-based case control study in new Hampshire. Cancer cause control 15,8,759-69,2004.

Chiang and Cheb examined the composition of the substances emitted by oil vapor during re-frying processes and found that most toxins are known carcinogens that cause the development of bladder cancer. After adding an antioxidant catedine to the oil and examining the toxins emitted after the addition, a significant reduction in the release of toxins was found during repeated frying. The authors conclude that frying in all types of oil is due to the high concentrations accumulated from frying to frying in food fried using the same oil several times over several days, causes massive emission of toxins associated with the development of bladder cancer and can be chemically reduced by chemical means.

Chiang TA et al. Mutagenicity and aromatic amine content of fumes from heated cooking oil products in Taiwan. Food chem toxicol 37,2-3,125-34,1999.

Doolin et al. looked at the employment of 2,457 people who died of bladder cancer. An overdose of bladder cancer mortality was found among ship mechanics, railroad mechanics, and power generation workers. An increased proportion was also found in workers in the fried food industry, including cooks and workers related to frying in vegetable oils and animal oils. The analysis found that what all these have in common is overexposure to benzene and lipid breakdown products.

Dolin PJ et al, Occupation and bladder cancer: a death certificate study. Br. J cancer. 66,568-578,1992.

Rahman et al. examined the association between exposure to PAHS and chronic kidney disease. This study examined the files of patients suffering from decreased renal filtration capacity and urinary protein excretion. Matching data were found in 4,117 patients, in whom urinary levels of PAHS were tested. It was found that an

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

increase in levels of 2 hydroxynaphthalene was directly associated with a statistically clear statistically significant association with chronic kidney failure.

Rahman HH,et al, Association of chronic kidney disease with exposure to polycyclic aromatic hydrocarbons in the US population. Environmental science and pollution research. 29'24024-34, 2022.

Kakabandi et al. conducted a literature survey of articles in the English medical literature demonstrating the association between male infertility and exposure to PAHS. These toxins have been proven to cause sperm damage and fertility, exposure to these toxins causes DNA damage in sperm cells, a decrease in the number and concentration of sperm cells, and damage to sperm cell morphology. The researchers conclude that the paper cites conclusive evidence from a large number of high-quality sources demonstrating a link between PAH'S and impaired male fertility. Exposure to these toxins impairs all parameters of sperm count, and in some of the articles, markers of oxidative damage to the DNA of the sperm cell as a result of exposure to these toxins were found in the sperm.

Kakavandi B, et al. Establishing the relationship between polycystic aromatic hydrocarbons (PAHS) exposure and male infertility. A systematic review. Ecotoxicology and environmental safety 250, 114485, 1-19, 2023.

The contribution of the global frying industry to the morbidity and mortality of consumers worldwide.

The biggest secret in the world of industrial frying, which meets us in most industrialized foods, is worse than frying in the restaurant industry, it turns out that some factories use the same oil for hundreds of frying between 3-10 days and finally throw it away. **On the other hand, global frying companies with dozens of frying plants around the world have developed a practice of not throwing oil at all**. Even after many days of frying in the same oil, instead of throwing away the burnt oil with the carcinogenic products, transfer it for filling tank "TOP UP" and automatically pour into the fryers with the new oil, in a measured manner between 5-10 percent at a time, and sometimes this action is hidden from the frying line workers, so that the oil with

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

carcinogenic toxins mixes with the new oil and is transferred directly to the fried food, which absorbs between 15-30 percent of the oil on average.

This is the contribution of the global frying industry to consumer morbidity and mortality worldwide.

Repeated use of frying oil causes an increase in the release of toxins into both the air and fried foods. The rate of toxic emissions increases as oil reuse continues.

Beyond oil filter powder

Since frying food is done in oil, and since in frying procedures oil is reused until it can no longer be used due to loss of properties, taste and mainly due to the spoilage processes that develop in the oil during repeated and continuous frying. These substances cause serious diseases and up to severe morbidity in cancers and are characteristic of exposure to fried oil vapor and eating it as part of the amount of oil absorbed in the food served to diners. And since this form of food preparation is not healthy for either the diner or the kitchen staff Beyond Oil. A technology has been developed to remove toxins emitted from the oil, so that the cooking product Has significantly less toxins for the benefit of the diner and a safer work environment and prevents occupational damage to chefs and kitchen staff.

All the articles and studies reporting on the damage caused by frying point to the need to create a safe work environment by reducing the emission of toxins as a result of frying and reducing the absorption of toxins in food. The direct link between toxins and cancer and chronic diseases requires measures to reduce toxins and the risk of developing cancer.

Beyond Oil's technology enables the treatment of frying oil using a unique environmentally friendly formula that allows the absorption and removal of toxins from the oil in repeated frying in a daily filtration process and thus keeps the frying oil looking and taste as good as fresh oil when it is free over time from toxins known to cause disease and cancer. Treatment of repeated oil using Beyond Oil's technology reduces its acidity to almost unmeasured levels. The biggest advantage of Beyond Oil's

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

technology is that it preserves the quality of the oil and reduces the rate of toxins even after repeated and continuous use of the same oil for frying for many days.

The technology experiments were carried out both by the company itself, and by some large food companies, and also by external control laboratories and independent labs; for example, Mérieux Nutrascience. Through the Israeli branch, Miloda tested and repeated the company's experiments Beyond Oil and came up with identical results. Miloda is a company for quality testing of various materials. The testing and control processes carried out in the laboratories are carried out in complete confidentiality, according to written protocols based on Israeli standards, and other international standards. All processes are audited by the Quality Assurance Department, which supervises the reliability and compliance of the processes in the laboratories with the strict standards and the required familiarity. Miloda laboratories are accredited by ISRAC - National Laboratory Accreditation Authority for Standard 17025 ISO/IEC.

The Antimicrobial Laboratory was recognized by ISRAC As recognized for conducting research according to general OECD-GLP.

The laboratory has Recognition by the Israeli? Ministry of Health for antimicrobial testing of water, Food Products, Cosmetics, Endotaxins and chemical testing of food. In addition to the laboratory, the company has recognition to the analytical laboratory with respect to wastewater and wastewater testing. The laboratories are certified as a factory laboratory for slaughterhouses and factories that process animal products. The laboratories have exclusive certification for testing grains and mixtures in Israel on behalf of GAFTA - World Organization for Grain and Grain Trade.

The laboratory has recognition for testing pesticide residues from the State of Israel, the Ministry of Agriculture and Rural Development, the Plant Protection and Inspection Services**.** Miloda's laboratories regularly participate in inter-laboratory comparison tests in Israel and abroad in all fields. The comparison tests are performed in leading companies such as AOCS, FAPAS, AFFCO, LGC, ERA and more.

The laboratory's certification certificates can be found at

https://www.merieuxnutrisciences.co.il/

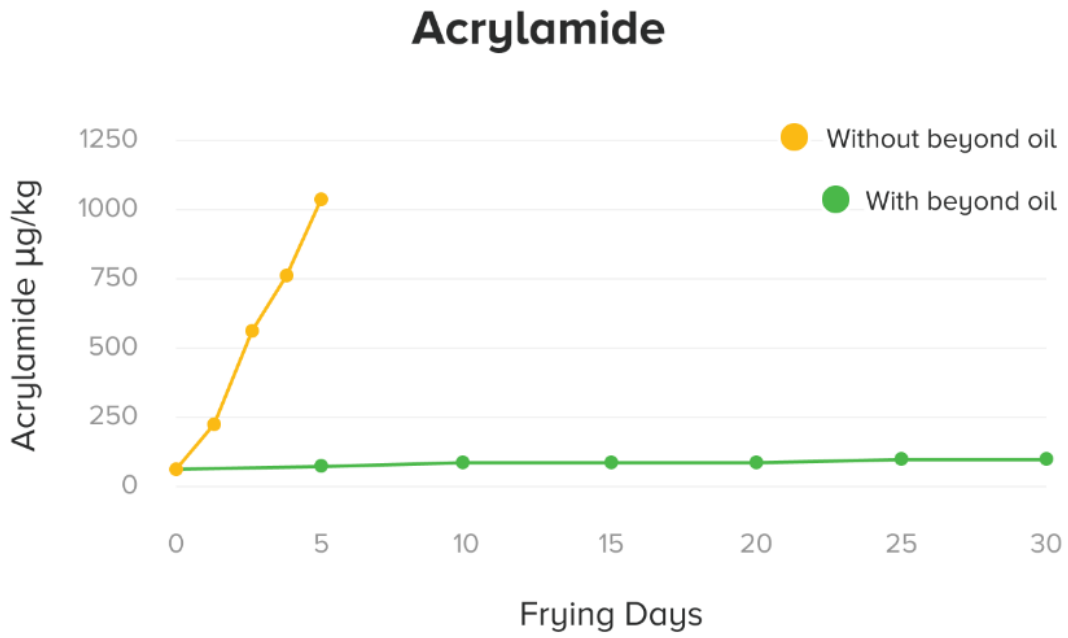
Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

Beyond Oil's technology allows the frying oil to be treated in a way that immediately reduces the emission of toxins, preserves the taste, quality and appearance of the oil. Prof. Gerty of the Hebrew University of Jerusalem conducted a number of experiments in Israel in which he examined the levels of the PAHS Without and with treatment technology Beyond Oil. Without treatment, the levels of toxins were 4.29+0.57 m3/kg, and after treatment, the levels were lower than 0.5 m3/kg even after 4 days of repeated frying in the same oil. Similar results were obtained in the measurement of acrylamides, anizinedin, free fatty acids.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

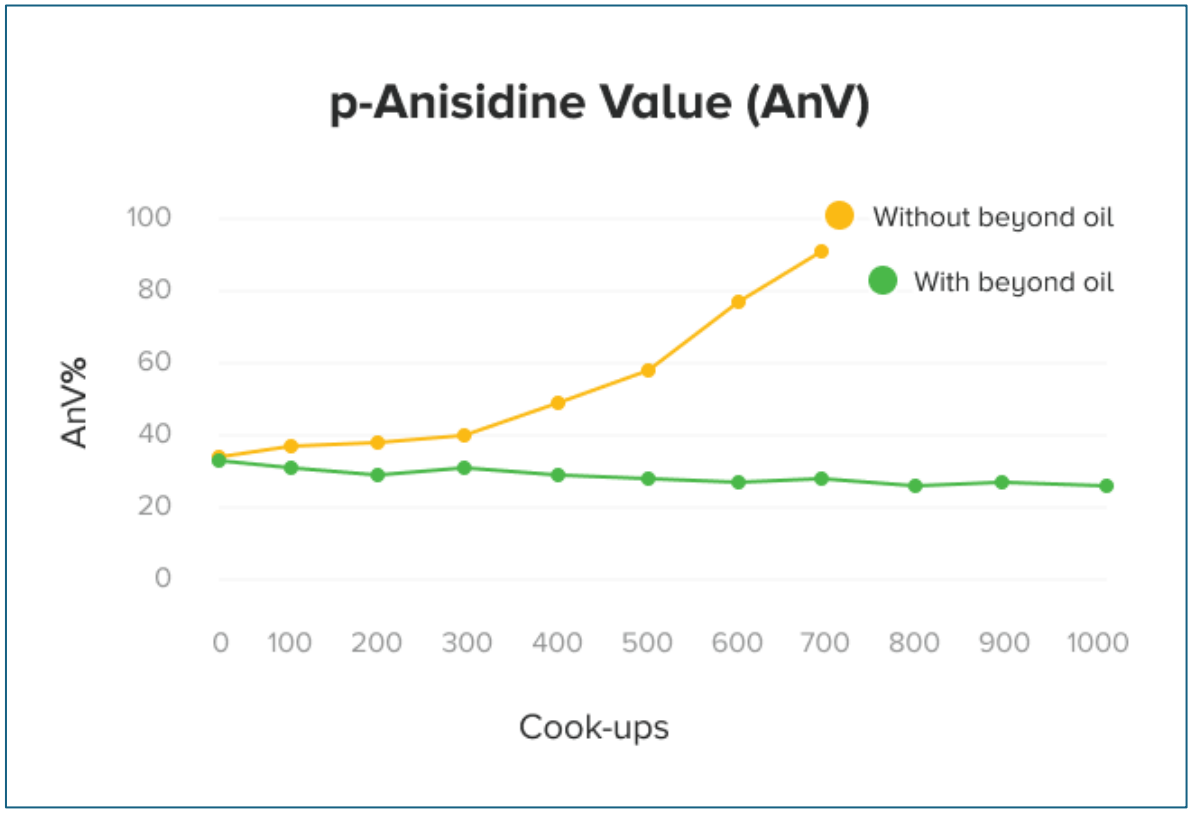
Beyond Oil's studies show a dramatic reduction to undetectable values in oil toxins after filtering using Beyond Oil's technology versus oil that has not undergone such filtering.

The graph below illustrates the rate of acrylamide toxin emissions, which is fundamentally high and increasing after refrying in oil that has not undergone any treatment (orange graph). On the other hand, frying in oil filtered using Beyond Oil's technology is depicted in the green graph. The toxin emission rate is significantly lower and does not materially increase despite repeated frying.



Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

The anisidine test is used to assess the level of oxidative damage to the oil and to detect unsaturated aldehydes in the oil, whose level is an indication of poor quality of the oil and a high rate of toxic emission by the oil. Testing anisidine frying oil with and without the use of the Beyond Oil technology also demonstrates dramatic differences. Untreated anisidine levels are high and increase with the reuse of oil and with filtering with the Beyond Oil technology, it can be seen that the levels are low and remain steadily low despite the repeated use of the oil.



Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

What are the total polar substances (TPM)?

Total polar materials (Total Polar Materials – TPM) also known as the sum total of polar compounds (Total Polar Compounds – TPC), are all products present in frying oil for a complex set of reactions, including hydrolysis (by water), oxidation (by air), and polymerization processes, including decomposition BEANS, decomposition products with low molecular weight, and polymerized materials. Figure 1 illustrates the three pathways to creation TPM After heating of vegetable oils.

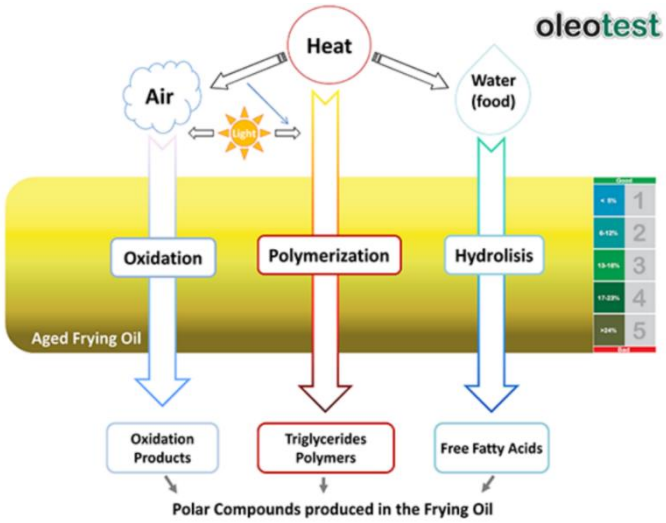


Figure 1: Hydrolysis, oxidation, and polymerization processes leading to the formation of polar substances such as free fatty acids, polymers, and oxidation products in frying oil.

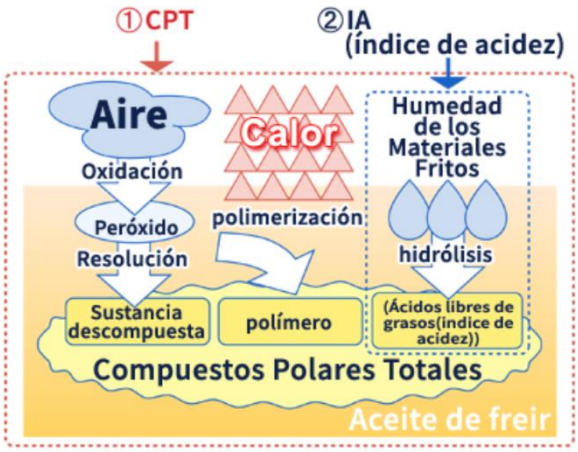


Figure 2: Parameters such as air, heat, and humidity affect the formation of total polar matter (TPM) and the mechanistic tracks

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

The TPM standard is set by the health authorities in each country, as a guideline for institutional kitchens and frying plants, at levels of 25 to 27% as the upper limit.

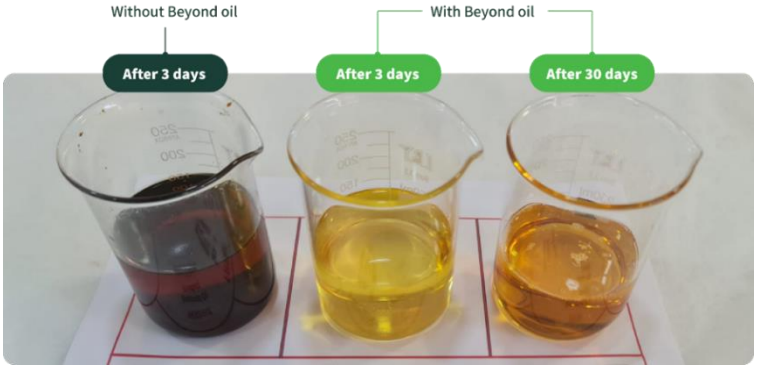
Some restaurants use a digital repeat fryer inspection device, which allows simple monitoring of the frying oil to detect a critical TPM and change the oil at the right moment, when the device indicates it.

Figure 3: A Simple Device That Measures the TPM by EC

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

The results of a study carried out with several of the world's largest frying companies and the indices of which were tested in internationally approved laboratories showed that after three frying days without Beyond Oil's filter powder, Oil quality values have reached hazardous indices that can lead to cancer risks for diners and employees.
While oil was fried with Beyond Oil's filter powder for 30 days, the oil contained significantly lower levels of TPC. This result shows how the use of Beyond Oil's filter powder allows the institutional and industrial market to use the retractable oil, but significantly reduces the health risks caused without the use of Beyond Oil's filter powder.

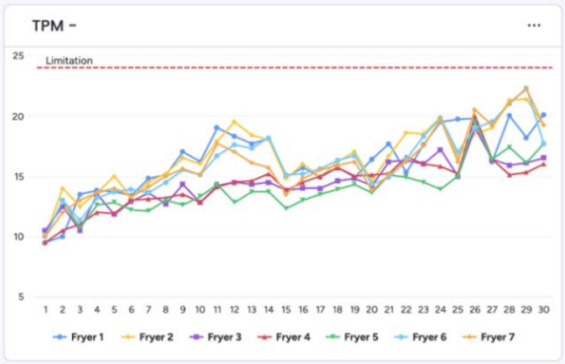
.



Quality photos of the oil, fried with and without Beyond Oil's filter powder, as sampled from the fryers

Total Polar Material ("TPM")

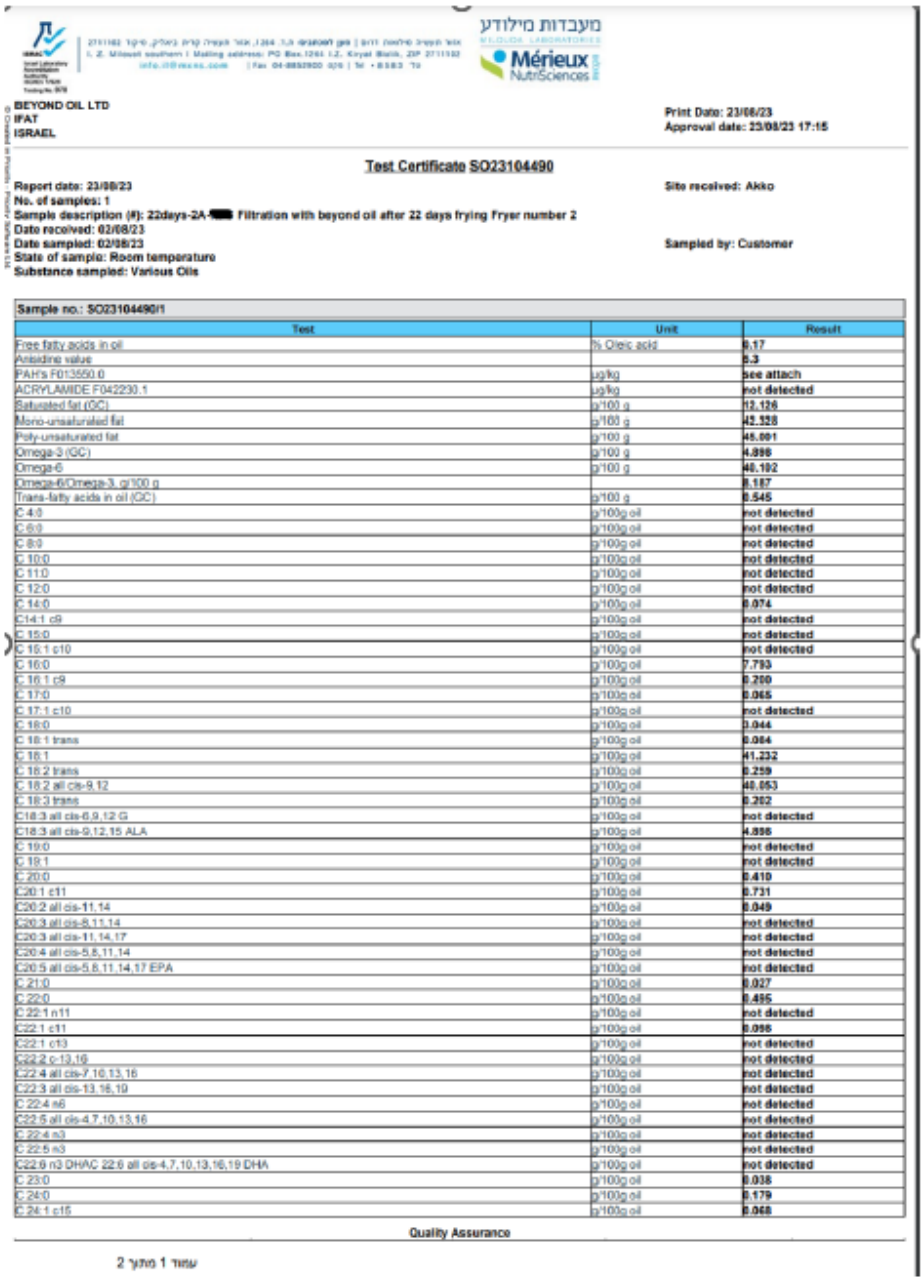
An examination of TPM results presents unique and surprising findings. The re-frying oil test result in restaurant chains and frying plantsafter3days without using Beyond Oil filter powder exceeds **27%,** compared to TPM values in oil after 22days of frying and handling Beyond Oil filter powder, which is **16%. During the trials and tests, all fryers using Beyond Oil powder did not cross the 24% TPM threshold during 30 frying days. In contrast, in reference tests used without Beyond Oil, fryers crossed the 27% TPM threshold** after only 4-5 days and reached **70% TPM after 8 days**.



Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

Results obtained in laboratory experiments

22-day re-fried frying oil analysis with the Beyond Oil technology



BEYOND OIL LTD
IFAT
ISRAEL

Print Date: 23/08/23
Approval date: 23/08/23 17:15

Test Certificate SO23104490

Report date: 23/08/23
No. of samples: 1
Sample description (#): 22days-2A-[redacted] Filtration with beyond oil after 22 days frying Fryer number 2
Date received: 02/08/23
Date sampled: 02/08/23
State of sample: Room temperature
Substance sampled: Various Oils

Site received: Akko

Sampled by: Customer

Sample no.: SO23104490/1

Test	Unit	Result
Free fatty acids in oil	% Oleic acid	0.17
Anisidine value		5.3
PAH's F013550.0	ug/kg	see attach
ACRYLAMIDE F042230.1	ug/kg	not detected
Saturated fat (GC)	g/100 g	12.126
Mono-unsaturated fat	g/100 g	42.328
Poly-unsaturated fat	g/100 g	45.001
Omega-3 (GC)	g/100 g	4.899
Omega-6	g/100 g	40.102
Omega-6/Omega-3, g/100 g		8.187
Trans-fatty acids in oil (GC)	g/100 g	0.545
C 4:0	g/100g oil	not detected
C 6:0	g/100g oil	not detected
C 8:0	g/100g oil	not detected
C 10:0	g/100g oil	not detected
C 11:0	g/100g oil	not detected
C 12:0	g/100g oil	not detected
C 14:0	g/100g oil	0.074
C14:1 c9	g/100g oil	not detected
C 15:0	g/100g oil	not detected
C 15:1 c10	g/100g oil	not detected
C 16:0	g/100g oil	7.793
C 16:1 c9	g/100g oil	0.200
C 17:0	g/100g oil	0.065
C 17:1 c10	g/100g oil	not detected
C 18:0	g/100g oil	3.044
C 18:1 trans	g/100g oil	0.084
C 18:1	g/100g oil	41.232
C 18:2 trans	g/100g oil	0.259
C 18:2 all cis-9,12	g/100g oil	40.053
C 18:3 trans	g/100g oil	0.202
C18:3 all cis-6,9,12 G	g/100g oil	not detected
C18:3 all cis-9,12,15 ALA	g/100g oil	4.899
C 19:0	g/100g oil	not detected
C 19:1	g/100g oil	not detected
C 20:0	g/100g oil	0.410
C20:1 c11	g/100g oil	0.731
C20:2 all cis-11,14	g/100g oil	0.049
C20:3 all cis-8,11,14	g/100g oil	not detected
C20:3 all cis-11,14,17	g/100g oil	not detected
C20:4 all cis-5,8,11,14	g/100g oil	not detected
C20:5 all cis-5,8,11,14,17 EPA	g/100g oil	not detected
C 21:0	g/100g oil	0.027
C 22:0	g/100g oil	0.495
C 22:1 n11	g/100g oil	not detected
C22:1 c11	g/100g oil	0.096
C22:1 c13	g/100g oil	not detected
C22:2 c-13,16	g/100g oil	not detected
C22:4 all cis-7,10,13,16	g/100g oil	not detected
C22:3 all cis-13,16,19	g/100g oil	not detected
C 22:4 n6	g/100g oil	not detected
C22:5 all cis-4,7,10,13,16	g/100g oil	not detected
C 22:4 n3	g/100g oil	not detected
C 22:5 n3	g/100g oil	not detected
C22:6 n3 DHAC 22:6 all cis-4,7,10,13,16,19 DHA	g/100g oil	not detected
C 23:0	g/100g oil	0.038
C 24:0	g/100g oil	0.179
C 24:1 c15	g/100g oil	0.068

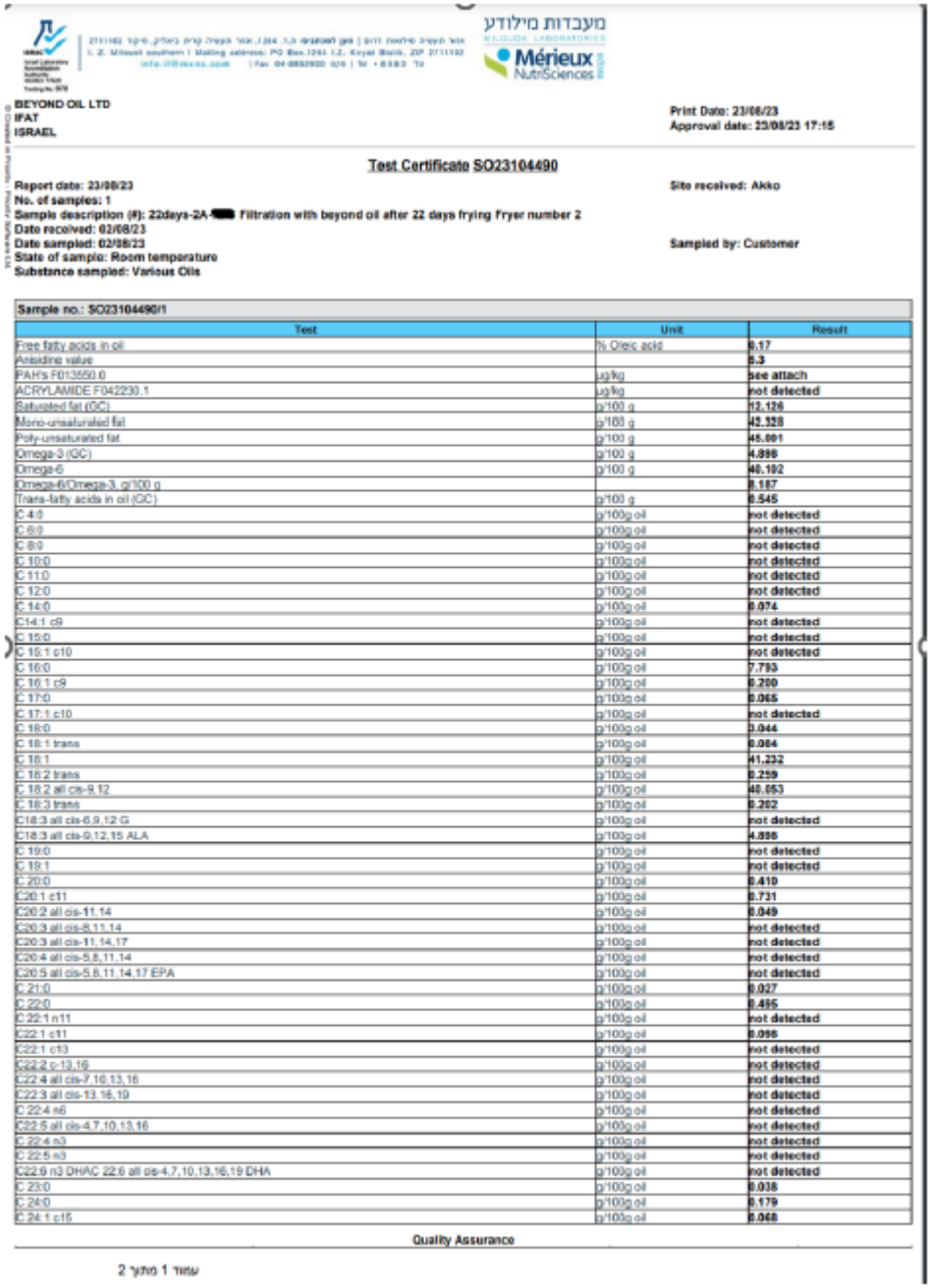
Quality Assurance

עמוד 1 מתוך 2

שמן מטיגה לאחר 22 ימי טיגון עם סינון ביונד אויל BOF

22-day re-fried frying oil analysis with the Beyond Oil technology

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il



מעבדות מילודע
Mérieux NutriSciences

BEYOND OIL LTD
IFAT
ISRAEL

Print Date: 23/08/23
Approval date: 23/08/23 17:15

Test Certificate SO23104490

Report date: 23/08/23
No. of samples: 1
Sample description (#): 22days-2A-[redacted] Filtration with beyond oil after 22 days frying Fryer number 2
Date received: 02/08/23
Date sampled: 02/08/23
State of sample: Room temperature
Substance sampled: Various Oils

Site received: Akko

Sampled by: Customer

Sample no.: SO23104490/1

Test	Unit	Result
Free fatty acids in oil	% Oleic acid	0.17
Anisidine value		5.3
PAH's F013550.0	ug/kg	see attach
ACRYLAMIDE F042230.1	ug/kg	not detected
Saturated fat (GC)	g/100 g	12.126
Mono-unsaturated fat	g/100 g	42.328
Poly-unsaturated fat	g/100 g	45.001
Omega-3 (GC)	g/100 g	4.898
Omega-6	g/100 g	40.102
Omega-6/Omega-3, g/100 g		8.187
Trans-fatty acids in oil (GC)	g/100 g	0.545
C 4:0	g/100g oil	not detected
C 6:0	g/100g oil	not detected
C 8:0	g/100g oil	not detected
C 10:0	g/100g oil	not detected
C 11:0	g/100g oil	not detected
C 12:0	g/100g oil	not detected
C 14:0	g/100g oil	0.074
C14:1 c9	g/100g oil	not detected
C 15:0	g/100g oil	not detected
C 15:1 c10	g/100g oil	not detected
C 16:0	g/100g oil	7.793
C 16:1 c9	g/100g oil	0.200
C 17:0	g/100g oil	0.065
C 17:1 c10	g/100g oil	not detected
C 18:0	g/100g oil	3.044
C 18:1 trans	g/100g oil	0.084
C 18:1	g/100g oil	41.232
C 18:2 trans	g/100g oil	0.259
C 18:2 all cis-9,12	g/100g oil	40.053
C 18:3 trans	g/100g oil	0.202
C18:3 all cis-6,9,12 G	g/100g oil	not detected
C18:3 all cis-9,12,15 ALA	g/100g oil	4.898
C 19:0	g/100g oil	not detected
C 19:1	g/100g oil	not detected
C 20:0	g/100g oil	0.410
C20:1 c11	g/100g oil	0.731
C20:2 all cis-11,14	g/100g oil	0.049
C20:3 all cis-8,11,14	g/100g oil	not detected
C20:3 all cis-11,14,17	g/100g oil	not detected
C20:4 all cis-5,8,11,14	g/100g oil	not detected
C20:5 all cis-5,8,11,14,17 EPA	g/100g oil	not detected
C 21:0	g/100g oil	0.027
C 22:0	g/100g oil	0.495
C 22:1 n11	g/100g oil	not detected
C22:1 c11	g/100g oil	0.098
C22:1 c13	g/100g oil	not detected
C22:2 c-13,16	g/100g oil	not detected
C22:4 all cis-7,10,13,16	g/100g oil	not detected
C22:3 all cis-13,16,19	g/100g oil	not detected
C 22:4 n6	g/100g oil	not detected
C22:5 all cis-4,7,10,13,16	g/100g oil	not detected
C 22:4 n3	g/100g oil	not detected
C 22:5 n3	g/100g oil	not detected
C22:6 n3 DHAC 22:6 all cis-4,7,10,13,16,19 DHA	g/100g oil	not detected
C 23:0	g/100g oil	0.038
C 24:0	g/100g oil	0.179
C 24:1 c15	g/100g oil	0.068

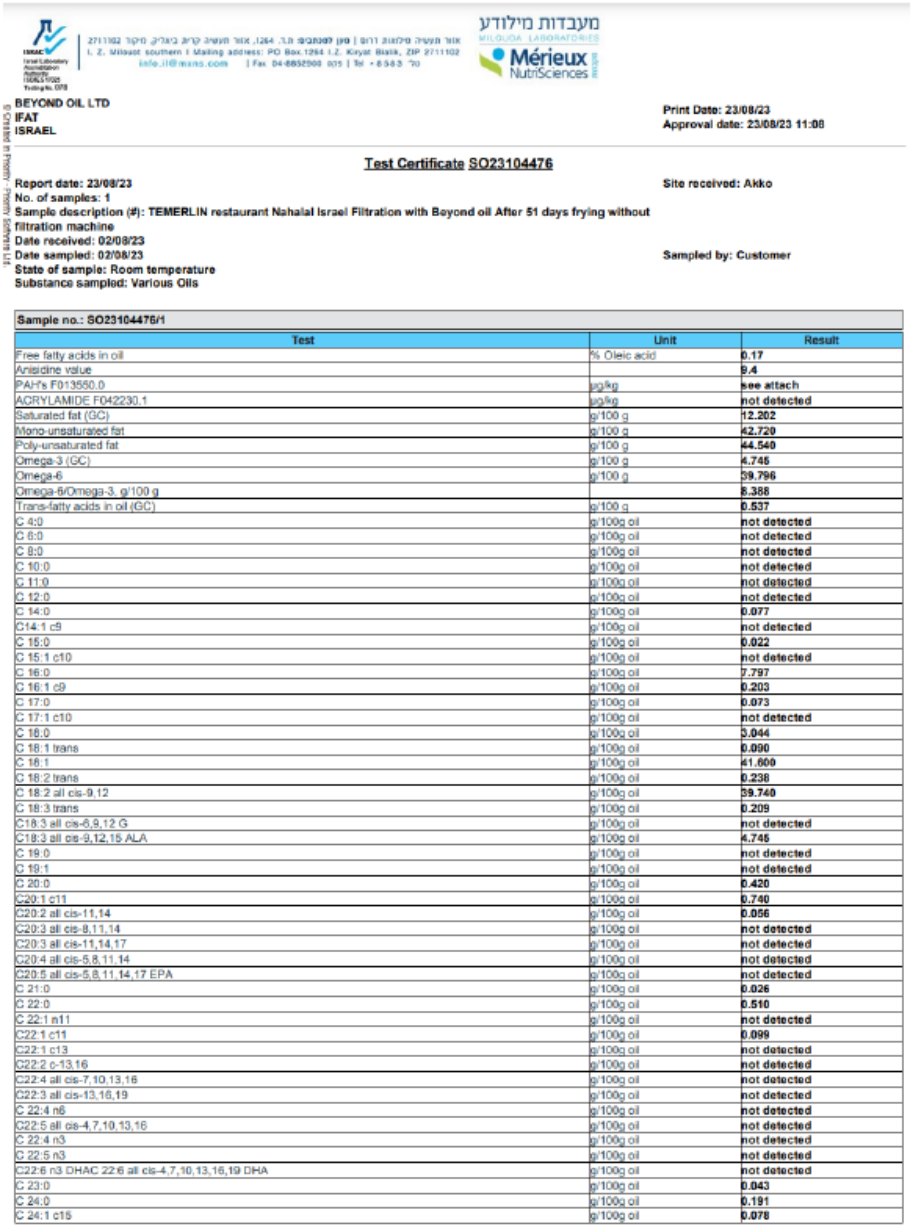
Quality Assurance

עמוד 1 מתוך 2

שמן מסעדה לאחר 22 ימי טיגון עם סינון ביונד אויל BOF

PAHS levels, after re-frying in oil with Beyond Oil's technology after 22 days.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il



מעבדות מילודע
MILGUDA LABORATORIES
Mérieux NutriSciences

BEYOND OIL LTD
IFAT
ISRAEL

Print Date: 23/08/23
Approval date: 23/08/23 11:08

Test Certificate SO23104476

Report date: 23/08/23
No. of samples: 1
Sample description (#): TEMERLIN restaurant Nahalal Israel Filtration with Beyond oil After 51 days frying without filtration machine
Date received: 02/08/23
Date sampled: 02/08/23
State of sample: Room temperature
Substance sampled: Various Oils

Site received: Akko

Sampled by: Customer

Sample no.: SO23104476/1

Test	Unit	Result
Free fatty acids in oil	% Oleic acid	0.17
Anisidine value		9.4
PAH's F013550.0	µg/kg	see attach
ACRYLAMIDE F042230.1	µg/kg	not detected
Saturated fat (GC)	g/100 g	12.202
Mono-unsaturated fat	g/100 g	42.720
Poly-unsaturated fat	g/100 g	44.540
Omega-3 (GC)	g/100 g	4.745
Omega-6	g/100 g	39.796
Omega-6/Omega-3, g/100 g		8.388
Trans-fatty acids in oil (GC)	g/100 g	0.537
C 4:0	g/100g oil	not detected
C 6:0	g/100g oil	not detected
C 8:0	g/100g oil	not detected
C 10:0	g/100g oil	not detected
C 11:0	g/100g oil	not detected
C 12:0	g/100g oil	not detected
C 14:0	g/100g oil	0.077
C14:1 c9	g/100g oil	not detected
C 15:0	g/100g oil	0.022
C 15:1 c10	g/100g oil	not detected
C 16:0	g/100g oil	7.797
C 16:1 c9	g/100g oil	0.203
C 17:0	g/100g oil	0.073
C 17:1 c10	g/100g oil	not detected
C 18:0	g/100g oil	3.044
C 18:1 trans	g/100g oil	0.090
C 18:1	g/100g oil	41.600
C 18:2 trans	g/100g oil	0.238
C 18:2 all cis-9,12	g/100g oil	39.740
C 18:3 trans	g/100g oil	0.209
C18:3 all cis-6,9,12 G	g/100g oil	not detected
C18:3 all cis-9,12,15 ALA	g/100g oil	4.745
C 19:0	g/100g oil	not detected
C 19:1	g/100g oil	not detected
C 20:0	g/100g oil	0.420
C20:1 c11	g/100g oil	0.740
C20:2 all cis-11,14	g/100g oil	0.056
C20:3 all cis-8,11,14	g/100g oil	not detected
C20:3 all cis-11,14,17	g/100g oil	not detected
C20:4 all cis-5,8,11,14	g/100g oil	not detected
C20:5 all cis-5,8,11,14,17 EPA	g/100g oil	not detected
C 21:0	g/100g oil	0.026
C 22:0	g/100g oil	0.510
C 22:1 n11	g/100g oil	not detected
C22:1 c11	g/100g oil	0.099
C22:1 c13	g/100g oil	not detected
C22:2 c-13,16	g/100g oil	not detected
C22:4 all cis-7,10,13,16	g/100g oil	not detected
C22:3 all cis-13,16,19	g/100g oil	not detected
C 22:4 n6	g/100g oil	not detected
C22:5 all cis-4,7,10,13,16	g/100g oil	not detected
C 22:4 n3	g/100g oil	not detected
C 22:5 n3	g/100g oil	not detected
C22:6 n3 DHAC 22:6 all cis-4,7,10,13,16,19 DHA	g/100g oil	not detected
C 23:0	g/100g oil	0.043
C 24:0	g/100g oil	0.191
C 24:1 c15	g/100g oil	0.078

51-day post-reuse frying oil analysis with Beyond Oil's technology

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

Mérieux NutriSciences
CHELAB S.R.L.

follow test report n. 23/000440337

LAB N° 0051 L

ANALYTICAL RESULTS

	Value/ Uncertainty	Unit of measure	LoQ	LoD	R	Start/end date of analysis	Op. units	Row
ON SAMPLE AS IT IS								1
POLYCYCLIC AROMATIC HYDROCARBONS (PAHs) Met.: MP 0998 rev 5 2018						10/08/2023--21/08/2023	01	2
Benzo (a) anthracene	2,34±0,55	µg/kg	0,50	0,25	107.9			3
Benzo (b) fluoranthene	1,00±0,24	µg/kg	0,50	0,25	100			4
Benzo (k) fluoranthene	traces	µg/kg	0,50	0,25	100			5
Benzo (a) pyrene	0,79±0,19	µg/kg	0,50	0,25	100			6
Indeno (1,2,3-CD) pyrene	traces	µg/kg	0,50	0,25	88.2			7
Dibenzo (a,h) anthracene	n.d.	µg/kg	0,50	0,25	88.2			8
Benzo (g,h,i) perylene	traces	µg/kg	0,50	0,25	88.2			9
Benzo (e) pyrene	0,97±0,23	µg/kg	0,50	0,25	88.2			10
Chrysene	4,5±1,1	µg/kg	0,50	0,25	100			11
PAHs 4	6,63±1,27	µg/kg						12
ACRYLAMIDE Met.: MP 2149 rev 1 2018	n.d.	µg/kg	20	6.0	98.7	10/08/2023--22/08/2023	01	13

Operative units

Unit 01 : Via Fratta Resana (TV)

Information on test methods and/or requirements/specifications

Row (2) - Method: MP 0998 rev 5 2018 = The determination of PAHs 4, if performed, is referred to the sum of the following polycyclic aromatic hydrocarbons: benzo(a)pyrene, benz(a)anthracene, benzo(b)fluoranthene and chrysene.

information provided by the client

Sampled by: Customer
Place of origin: MILOUDA & MIGAL LABORATORIES LIMITED PARTNERSHIP I.Z MILOUOT SOUTHERN, ACRE 25201 MILOUOT Israele
Description: SO23104476 - PO23002882 - different oils

Chemical responsible

Dott. Emiliano Castellano

Chimico
Ordine dei Chimici e dei Fisici della Toscana
N. 1631 - Sez. A

Num. certificato WSREF-645766907156345 emesso dall'ente certificatore ArubaPEC S.p.A. NG CA 3, ArubaPEC S.p.A., IT

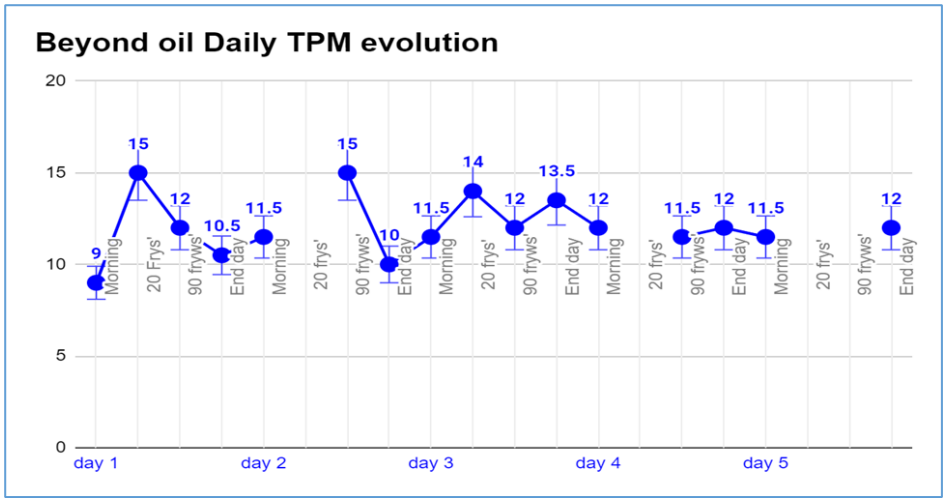
- The line marked by a star (*) is not accredited by Accredia, member of MLA. - If not otherwise specified, the uncertainty is extended and has been calculated with a coverage factor k=2 corresponding to a probability interval of about 95%. - LoD is the detection limit and identifies a confidence interval of zero with a probability interval of about 99%. - LoQ is the limit of quantification."n.d" is not detected and indicates a value inferior to the LoD. "traces (X)" means a value between LoD and LoQ, this value is indicative. "<x" or ">x" indicate inferior or superior to the measurement field of the test. - If not differently specified, the sums are calculated by lower bound criteria (L.B.).- Analysis Starting date: date at which the sample is processed by the laboratory. Can include aliquoting and homogenization steps. Analysis End date: date at which the results are approved in LIMS by the laboratory. - In case of alteration of the sample the laboratory declines any responsibility on the results that can be influenced by the deviation in case the customer asks for the execution of the test anyway. - If the sampling is not carried out by the laboratory staff, the results obtained are considered referring to the sample as received and the laboratory declines its responsibility for the results calculated considering the sampling data provided by the Customer. The name and contact information of the Customer are always provided by the Customer. - R is the recovery, recoveries marked by an hashtag (#) have not been used in the calculations. - If there is a specification (customer specifications, law limits) which has been compared to the analytical results, the values shown in bold indicate a result which is out of the specification. - If not differently specified the judgments of compliance /non-compliance eventually reported are referred to analysed parameters and are based on the comparison of the value with the reference values without considering the confidence interval of measure.

PAHS levels after re-frying in oil with Beyond Oil's technology after 51 days.

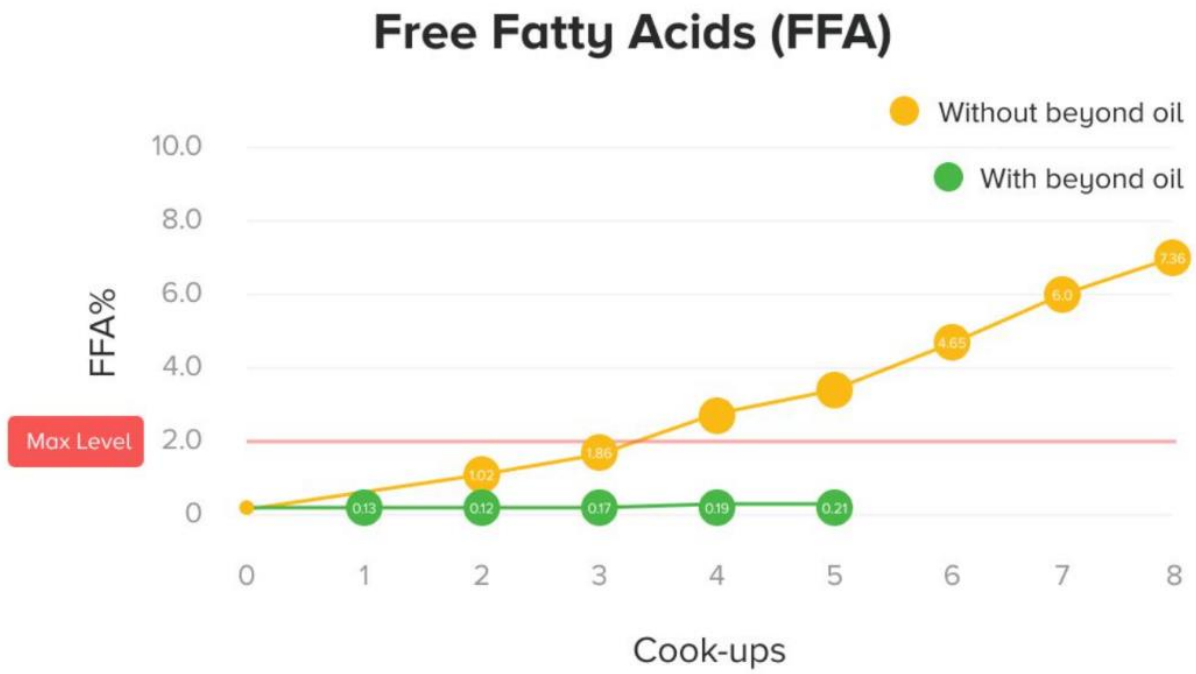
Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

Studies and experiments in Israel and around the world to examine the effectiveness of the filter powder of Beyond Oil. In the food industry, as mentioned above, the continuous oil frying processes are not unique to the world of restaurants and institutional kitchens. A significant part of the food industry deals with fried or semi-fried food intended on the one hand for the institutional market (restaurants, hotels, catering companies and banquet halls...) and on the other hand sold directly to the consumer through food chains. Some factories use frying oils for several days, in some cases 3-10 days or more, and in fact allows the development of a high concentration of spoilage products defined as toxins. These toxins are absorbed into the food that consumers eat or inhaled by production workers during their work.

In experiments conducted with frying facilities, the Beyond Oil powder was used, and in oils taken from of Beyond Oil. In oils taken from fryers on the production line versus oils treated in the process of Beyond Oil and have been fried in an equivalence ratio to production. The following graphs clearly show the significant differences between oil with and without Beyond Oil treatment.
It is clear that the TPM values according to Beyond Oil's re-frying oil treatment protocol remain at values almost identical to its new name – and meet all regulations of 25-27% in this parameter.



Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il



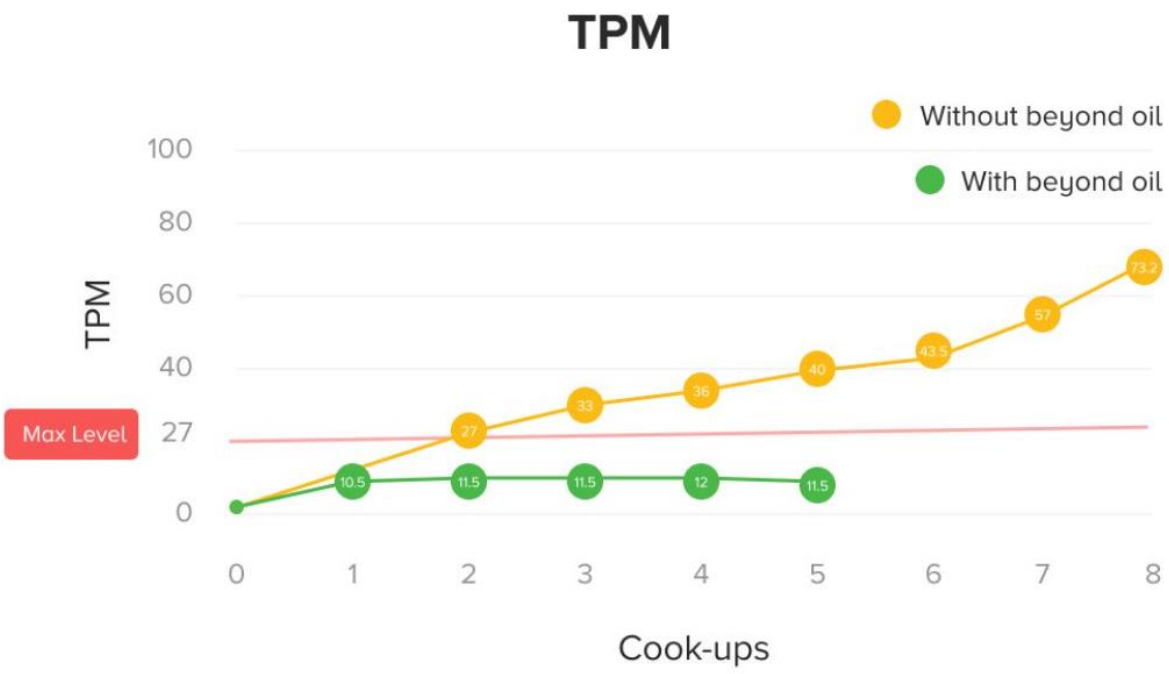
Value comparison between oil treated according to protocol Beyond Oil (green graph) versus oil from frying plant without using Beyond oil (yellow graph) according to the number of frying days.

Standard in different countries is a maximum value of 1-2% FFA

The results of the examined enterprises significantly exceeded the permissible threshold and reached a value of 7% FFA.

There is no doubt that eating fried food soaked in oil with these abnormal values endangers the health of consumers.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il



Value comparison TPM Between oil treated according to protocol Beyond Oil (green graph) versus oil from frying plant without using Beyond oil (yellow graph) according to the number of frying days.

Standard in different countries stands at a maximum values of 25-27% TPM.

The results of the examined enterprises significantly exceeded the permissible threshold and reached a value of 70% TPM

There is no doubt that eating fried food soaked in oil with these abnormal values endangers the health of diners.

It can be clearly seen that the filtration process preserves the quality of the oil and as a result, allows the use of the oil without any risk over time. The fear of the development of toxic substances in oil has disappeared due to the fact that objective indicators of its quality meet every regulatory parameter and ensure a healthier use of oil.

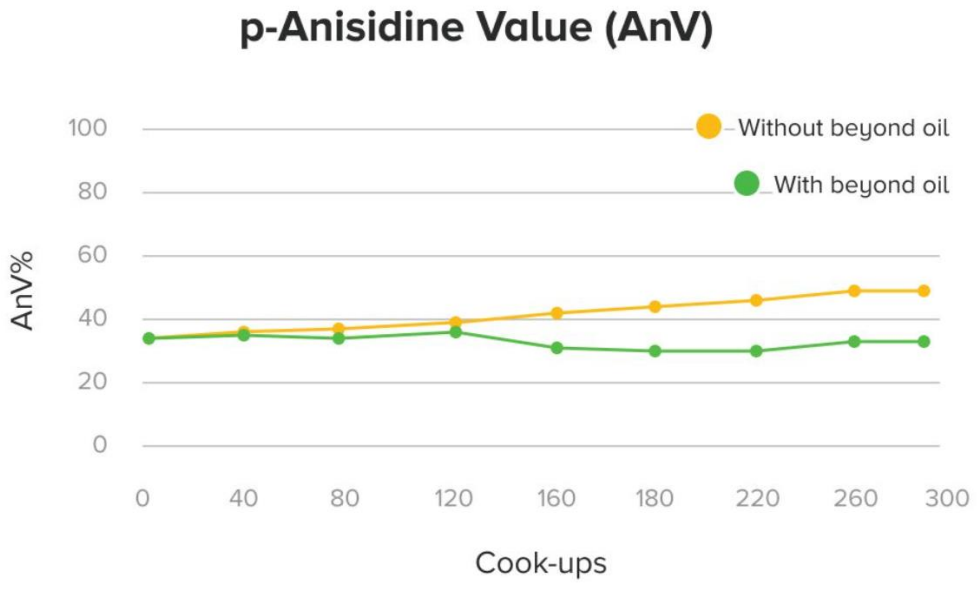
Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

An experiment of hundreds of fryers in the same oil, as carried out in several large factories

The experiment was carried out in two separate fryers, frying 1- the oil was filtered every day with the filter powder of Beyond Oil while fryer 2 was used as a reference (without Beyond Oil). The same quantities of frying were carried out and at the same times in both fryers. Results obtained after 14 days and after 300 frying cycles:

- Fry 1- The oil was filtered every day with the Beyond Oil filter powder - the oil started at a value of 37% AnV and even after 300 frying cycles remained at the same value.
- Fry 2 was used as a reference (without Beyond Oil) The oil started at a value of 37% AnV and after 300 increased to a value of 50% AnV

The conclusion: proves beyond doubt; The use of Beyond Oil filter powder prevents the development of anisidine, which is a marker for oxidation of one of the oil's spoilage reactions.



Value comparison AnV Between oil treated according to protocol Beyond Oil (green graph) vs. oil without Beyond Oil (yellow graph) according to the number of 300 frying cycles performed over 14 days.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

Conclusions:

Re-frying in frying oil is rooted in every kitchen in the institutional and industrial world: in restaurants, hotels, banquet halls and catering and in huge factories of large food companies that feed most of the world fried food.

Frying food in oil repeatedly in oil even for a few days causes a high emission of toxins into the air and is absorbed into the fried food.

Many studies have mapped and found the types of toxins emitted by reusing frying oil and many studies demonstrate that these toxins cause cancer and disease in all body systems in general and in the urological system in particular. These toxins are certain to cause bladder cancer, chronic kidney disease, and infertility.

Both researchers and institutions of occupational health and environmental protection recognize the urgent need to reduce the rate of emissions and exposure to eating toxins in the recurrent oil absorbed in fried foods. So far, the health authorities and governments have not been able to provide a solution that will allow frying factories and the restaurant industry to continue using the oil repeatedly, hundreds of times, for several days in the same oil, and without a solution, the situation continues like this for decades, causing serious health damage to a public that is not even aware of the facts.

Beyond Oil It is considered a leader in its field due to its effectiveness in maintaining the quality of reusable frying oil. The powder contains Formulation of A unique blend of over 10 ingredients designed to absorb and reduce the formation of harmful substances such as free radicals, acrylamide, substances Polycyclic Aromatic (PAHs), trans fats, and free fatty acids.

The many studies and experiments carried out over many years, including experiments In frying plants And in some of the world's leading fast food chains, It is shown that the powder significantly reduces the risk of disease by lowering the levels

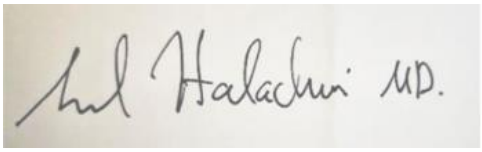
Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

of these harmful substances. The results prove its contribution to improving global health through the reduction of harmful substances in fried foods.

The study concludes that Beyond Oil's filter powder represents a global scientific breakthrough in protecting public health, and serves as an effective and proven tool for reducing morbidity caused by the consumption of fried foods fried in the institutional and industrial markets.

As professor – head of the urology department at the hospital, who deals with the field Urology For many years he has been researching the effects on bladder cancer, and chronic kidney disease and infertility. And well aware of the many studies published in the medical world and the direct harm of eating fried foods fried in oil that repeats humanity, This is a problem A global solution that health organizations around the world need to solve to protect the public, I recommend to health authorities around the world Test and adopt technology of Beyond Oil, and carry out joint studies with it to make use Beyond Oil Mandatory fix in every fryer in the world.

Applying these conclusions and learning from the need to use the filter powder of Beyond Oil As part of the worldview of preventive medicine, it will benefit the public and reduce morbidity for millions of people around the world.



15.7.2024

_____

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology

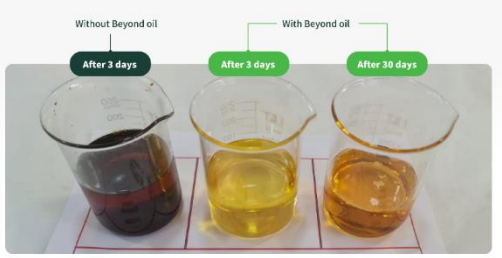
Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

Restaurant, Canada - Filtering with a filtering machine - Armadillo-September 2022

Day Of Filtration	Date	Temp. (CELSIUS)	TPM After filter 08.30	FFA%	Clarity (צלילות)	Frying	Sediments(משקעים)	Color	Smell	Meets the standard
1	11/12/2022	164	3	0.1	Passed	Passed	Passed	Light Yellow	Passed	Passed
2	13/11/2022	170	3.5	0.08	Passed	Passed	Passed	Light Yellow	Passed	Passed
3	14/11/2022	168	4.5	0.15	Passed	Passed	Passed	Light Yellow	Passed	Passed
4	15/11/2022	165	5	0.09	Passed	Passed	Passed	Light Yellow	Passed	Passed
5	16/11/2022	169	4.5	0.1	Passed	Passed	Passed	Light Yellow	Passed	Passed
6	17/11/2022	165	5.5	0.07	Passed	Passed	Passed	Light Yellow	Passed	Passed
7	18/11/2022	163	5	0.12	Passed	Passed	Passed	Light Yellow	Passed	Passed
8	19/11/2022	165	5.5	0	Passed	Passed	Passed	Light Yellow	Passed	Passed
9	20/11/2022	173	5	0.08	Passed	Passed	Passed	Yellow	Passed	Passed
10	21/11/2022	168	6	0.12	Passed	Passed	Passed	Yellow	Passed	Passed
11	22/11/2022	165	5.5	0.13	Passed	Passed	Passed	Yellow	Passed	Passed
12	23/11/2022	175	5	0	Passed	Passed	Passed	Yellow	Passed	Passed
13	24/11/2022	160	7.5	0.18	Passed	Passed	Passed	Yellow	Passed	Passed
14	25/11/2022	163	7	0.07	Passed	Passed	Passed	Yellow	Passed	Passed
15	26/11/2022	164	7	0.1	Passed	Passed	Passed	Yellow	Passed	Passed
16	27/11/2022	162	6	0.09	Passed	Passed	passed	Yellow	Passed	Passed
17	28/11/2022	163	6.5	0.07	Passed	Passed	passed	Yellow	Passed	Passed
18	29/11/2022	172	6	0	Passed	Passed	passed	Golden Yellow	Passed	Passed
19	29/12/2022	164	7.5	0.21	Passed	Passed	passed	Golden Yellow	Passed	Passed
20	30/12/2022	160	7.5	0.22	Passed	Passed	passed	Golden Yellow	Passed	Passed
21	31/12/2022	165	6.5	0.04	Passed	Passed	passed	Golden Yellow	Passed	Passed

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

Restaurant - Haifa - Israel - Filtering with a filtering machine - Armadillo- November 2022- January 2023											
Day Of Filtration	Date	Experime Sample Z/A	Temp. (CELSIUS)	TPM After filter 08.30	FFA%	Clarity (צלילות)	Frying	Sediments(משקעים)	Color	Smell	Meets the standard
Information - the restaurant's oil is changed every 3 working days - it becomes black and frothy - an example of the oil after 3 days of frying without a Beyond Oil filter powder											
1.1	12/10/2022	Z	176	21.8	2.12	Failed	Failed	Failed	Black	Failed	Failed
1	12/11/2022	0	162.6	4.5	0.35	Passed	Passed	Passed	Light Yellow	Passed	Passed
2	12/12/2022	A	144.5	6	0.23	Passed	Passed	Passed	Light Yellow	Passed	Passed
3	13/12/2022	A	144.6	7.5	0.17	Passed	Passed	Passed	Light Yellow	Passed	Passed
4	14/12/2022	A	172	8.5	0.23	Passed	Passed	Passed	Light Yellow	Passed	Passed
5	15/12/2022	A	174	9	0.27	Passed	Passed	Passed	Light Yellow	Passed	Passed
6	16/12/2022	A	176	13.5	0.29	Passed	Passed	Passed	Light Yellow	Passed	Passed
7	17/12/2022	A	146	10.5	0.41	Passed	Passed	Passed	Light Yellow	Passed	Passed
8	18/12/2022	A	174	12.5	0.41	Passed	Passed	Passed	Light Yellow	Passed	Passed
9	19/12/2022	A	144	10.5	0.38	Passed	Passed	Passed	Yellow	Passed	Passed
10	20/12/2022	A	161	11	0.32	Passed	Passed	Passed	Yellow	Passed	Passed
11	21/12/2022	A	171	10.5	0.34	Passed	Passed	Passed	Yellow	Passed	Passed
12	22/12/2022	A	171	12	0.39	Passed	Passed	Passed	Yellow	Passed	Passed
13	23/12/2022	A	174	13.5	0.31	Passed	Passed	Passed	Yellow	Passed	Passed
14	24/12/2022	A	173	13	0.35	Passed	Passed	Passed	Yellow	Passed	Passed
15	25/12/2022	A	171	14	0.29	Passed	Passed	Passed	Yellow	Passed	Passed
16	26/12/2022	A	176	12.5	0.33	Passed	Passed	passed	Yellow	Passed	Passed
17	27/12/2022	A	172	13.5	0.37	Passed	Passed	passed	Yellow	Passed	Passed
18	28/12/2022	A	170	15.5	0.5	Passed	Passed	passed	Golden Yellow	Passed	Passed
19	29/12/2022	A	172	16.5	0.55	Passed	Passed	passed	Golden Yellow	Passed	Passed
20	30/12/2022	A	176	13.5	0.6	Passed	Passed	passed	Golden Yellow	Passed	Passed
21	31/12/2022	A	173	15	0.6	Passed	Passed	passed	Golden Yellow	Passed	Passed
22	1.1.2023	A	175	13	0.7	Passed	Passed	passed	Golden Yellow	Passed	Passed
23	3.1.2023	A	176	14.5	0.58	Passed	Passed	passed	Golden Yellow	Passed	Passed
24	4.1.2023	A	176	14	0.58	Passed	Passed	passed	Golden Yellow	Passed	Passed
25	5.1.2023	A	172	15.5	0.62	Passed	Passed	passed	Golden Yellow	Passed	Passed
26	6.1.2023	A	174	12	0.58	Passed	Passed	passed	Golden Yellow	Passed	Passed
27	7.1.2023	A	153	14.5	0.52	Passed	Passed	passed	Golden Yellow	Passed	Passed
28	8.1.2023	A	169	12.5	0.46	Passed	Passed	passed	Golden Yellow	Passed	Passed
29	9.1.2023	A	172	13.5	0.39	Passed	Passed	passed	Golden Yellow	Passed	Passed
30	10.1.2023	A	175	14	0.43	Passed	Passed	passed	Golden Yellow	Passed	Passed



Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

Restaurant - Nahalel - Israel												
Day Of Filtration	Date	Experiment Sample Z/A	Temp. (CELSIUS)	זמן ערבוב בדקות	TPM After filter 08.30	FFA%	Clarity (צלילות)	Frying	Sediments (משקעים)	Color	Smell	Meets the standard
Information - the restaurant's oil is changed every 3 working days - it becomes black and frothy - an example of the oil after 2 days of frying without a Biond filter (sent to recycling)												
1.1		Z	175		33	1.68	Failed	Failed	Failed	Black	Failed	Failed
ng of an experiment with Beyond Oil - adding powder at night in a special pot - filtering - measuring the night before and in the morning after t												
Manual mixing for one minute												
1	01/03/2023	O	170	1	4.5	0.07	Passed	Passed	Passed	Light Yellow	Passed	Passed
2	02/03/2023	A	169	1	7.5	0.094	Passed	Passed	Passed	Light Yellow	Passed	Passed
3	03/03/2023	A	170	1	9.5	0.088	Passed	Passed	Passed	Light Yellow	Passed	Passed
4	04/03/2023	A	169	1	11	0.12	Passed	Passed	Passed	Light Yellow	Passed	Passed
	05/03/2023	A	Closed									
5	06/03/2023	A	167	1	12	0.14	Passed	Passed	Passed	Light Yellow	Passed	Passed
6	07/03/2023	A	165	1	14	0.15	Passed	Passed	Passed	Light Yellow	Passed	Passed
7	08/03/2023	A	163	1	16	0.16	Passed	Passed	Passed	Light Yellow	Passed	Passed
8	09/03/2023	A	165	1	19	0.21	Passed	Passed	Passed	Light Yellow	Passed	Passed
9	10/03/2023	A	170	1	15	0.22	Passed	Passed	Passed	Light Yellow	Passed	Passed
10	11/03/2023	A	169	1	15.5	0.22	Passed	Passed	Passed	Light Yellow	Passed	Passed
	12/03/2023	A	Closed									
11	13/03/2023	A	167	1	11	0.22	Passed	Passed	Passed	Light Yellow	Passed	Passed
12	14/03/2023	A	175	1	14	0.199	Passed	Passed	Passed	Light Yellow	Passed	Passed
13	15/03/2023	A	164	1	14.5	0.22	Passed	Passed	Passed	Light Yellow	Passed	Passed
14	16/03/2023	A	165	1	16	0.22	Passed	Passed	Passed	Light Yellow	Passed	Passed
15	17/03/2023	A	169	1	19.5	0.26	Passed	Passed	Passed	Yellow	Passed	Passed
16	18/03/2023	A	171	1	13	0.19	Passed	Passed	Passed	Yellow	Passed	Passed
	19/03/2023	A	Closed									
17	20/03/2023	A	164	1	13.5	0.29	Passed	Passed	Passed	Yellow	Passed	Passed
18	21/03/2023	A	169	1	16	0.24	Passed	Passed	Passed	Yellow	Passed	Passed
19	22/03/2023	A	169	1	18.5	0.28	Passed	Passed	Passed	Yellow	Passed	Passed
20	23/03/2023	A	171	1	18.5	0.29	Passed	Passed	Passed	Yellow	Passed	Passed
21	24/03/2023	A	169	1	18.5	0.36	Passed	Passed	Passed	Yellow	Passed	Passed
22	25/03/2023	A	170	1	12.5	0.29	Passed	Passed	Passed	Yellow	Passed	Passed
	26/03/2023	A	Closed									
23	27/03/2023	A	166	1	13.5	0.35	Passed	Passed	Passed	Yellow	Passed	Passed
24	28/03/2023	A	166	1	15	0.39	Passed	Passed	Passed	Yellow	Passed	Passed
25	29/03/2023	A	170	1	17	0.4	Passed	Passed	Passed	Yellow	Passed	Passed
26	30/03/2023	A	171	1	15.5	0.34	Passed	Passed	Passed	Yellow	Passed	Passed
27	31/03/2023	A	168	1	17.5	0.35	Passed	Passed	Passed	Yellow	Passed	Passed
28	01/04/2023	A	170	1	16.5	0.37	Passed	Passed	Passed	Yellow	Passed	Passed
		A	Closed									
29	03/04/2023	A	171	1	18.5	0.47	Passed	Passed	Passed	Yellow	Passed	Passed
30	04/04/2023	A	174	1	17	0.47	Passed	Passed	Passed	Yellow	Passed	Passed
		A	Closed									
		A	Closed									
31	07/04/2023	A	174	1	19	0.29	Passed	Passed	Passed	Yellow	Passed	Passed
32	08/04/2023	A	169	1	20.5	0.41	Passed	Passed	Passed	Yellow	Passed	Passed
33	09/04/2023	A	172	1	19.5	0.37	Passed	Passed	Passed	Yellow	Passed	Passed
34	10/04/2023	A	166	1	19	0.34	Passed	Passed	Passed	Yellow	Passed	Passed
35	11/04/2023	A	171	1	17	0.29	Passed	Passed	Passed	Yellow	Passed	Passed
36	12/04/2023	A	174	1	17	0.37	Passed	Passed	Passed	Yellow	Passed	Passed
37	13/04/2023	A	171	1	16.5	0.38	Passed	Passed	Passed	Yellow	Passed	Passed
38	14\04\2023	A	169	1	20	0.5	Passed	Passed	Passed	Yellow	Passed	Passed
39	15\04\2023	A	169	1	20	0.54	Passed	Passed	Passed	Yellow	Passed	Passed
	16\04\2023	A	Closed									
40	17\04\2023	A	176	1	15	0.32	Passed	Passed	Passed	Yellow	Passed	Passed
41	18\04\2023	A	172	1	14	0.35	Passed	Passed	Passed	Yellow	Passed	Passed
42	19\04\2023	A	165	1	17	0.47	Passed	Passed	Passed	Yellow	Passed	Passed
43	20\04\2023	A	160	1	18.5	0.52	Passed	Passed	Passed	Yellow	Passed	Passed
44	21\04\2023	A	165	1	20.5	0.52	Passed	Passed	Passed	Yellow	Passed	Passed
45	22\04\2023	A	167	1	15	0.38	Passed	Passed	Passed	Yellow	Passed	Passed

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

Restaurant - Ifat - Israel-January-February- 2023												
Day Of Filtration	Date	Experiment Sample Z/A	Temp. (CELSIUS)	זמן ערבוב בדקות	TPM After filter 08.30	FFA%	Clarity (צלילות)	Frying	Sediments (משקעים)	Color	Smell	Meets the standard
Information - the restaurant's oil is changed every 3 working days - it becomes black and frothy - an example of the oil after 3 days of frying without a Beyond Oil filter powder												
1.1		Z	176		25	1.54	Failed	Failed	Failed	Black	Failed	Failed
Beginning of an experiment with Beyond Oil - manual mixing in a special pot - filtering outside the fryer												
1	23/01/2023	0	168	1	4.5	0.17	Passed	Passed	Passed	Light Yellow	Passed	Passed
2	24/01/2023	A	170	1	6.5	0.16	Passed	Passed	Passed	Light Yellow	Passed	Passed
3	25/01/2023	A	168	1	9	0.19	Passed	Passed	Passed	Light Yellow	Passed	Passed
4	26/01/2023	A	170	1	12	0.27	Passed	Passed	Passed	Light Yellow	Passed	Passed
5	27/01/2023	A	172	1	14	0.21	Passed	Passed	Passed	Yellow	Passed	Passed
6	28/01/2023	A	169	1	15.5	0.5	Passed	Passed	Passed	Yellow	Passed	Passed
7	29/01/2023	A	170	1	15.5	0.43	Passed	Passed	Passed	Yellow	Passed	Passed
8	**30/01/2023**	A	168	1	13.5	0.41	Passed	Passed	Passed	Yellow	Passed	Passed
9	31/01/2023	A	169	1	14.5	0.48	Passed	Passed	Passed	Yellow	Passed	Passed
10	01/02/2023	A	170	1	17	0.43	Passed	Passed	Passed	Yellow	Passed	Passed
11	02/02/2023	A	170	1	16	0.39	Passed	Passed	Passed	Light brown	Passed	Passed
12	03/02/2023	A	168	1	17	0.43	Passed	Passed	Passed	Light brown	Passed	Passed
13	**04/02/2023**	A	161	1	13	0.34	Passed	Passed	Passed	Brown	Passed	Passed
14	05/02/2023	A	174	1	15	0.35	Passed	Passed	Passed	Brown	Passed	Passed
15	06/02/2023	A	172	1	17	0.38	Passed	Passed	Passed	Brown	Passed	Passed
16	07/02/2023	A	173	1	18	0.43	Passed	Passed	Passed	Brown	Passed	Passed
17	08/02/23	A	167	1	17	0.48	Passed	Passed	Passed	Brown	Passed	Passed
18	09/02/2023	A	169	1	15	0.44	Passed	Passed	Passed	Brown	Passed	Passed
19	**10/02/2023**	A	171	1	17	0.47	Passed	Passed	Passed	Brown	Passed	Passed
20	11/02/2023	A	174	1	14	0.35	Passed	Passed	Passed	Brown	Passed	Passed

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

Restaurant - Israel-May 2022												
Meets the standard	Smell	Color	Sediments (משקעים)	Frying	Clarity (צלילות)	FFA%	TPM After filter 08.30	Mixing time in minutes	Temp. (CELSIUS)	Experiment Sample Z/A	Date	Day Of Filtration
Information - the restaurant's oil is changed every 3 working days - it becomes black and frothy - an example of the oil after 3 days of frying without a Beyond Oil filter powder												
Failed	Failed	Black	Failed	Failed	Failed	1.87	28		168	Z		1.1
Beginning of an experiment with Beyond Oil - Filtering with a filtering machine, armadillo type												
Passed	Passed	Light Yellow	Passed	Passed	Passed	0.29	7.4	10	169	0	01/05/2022	1
Passed	Passed	Light Yellow	Passed	Passed	Passed	0.19	7.9	10	170	A	02/05/2022	2
Passed	Passed	Light Yellow	Passed	Passed	Passed	0.21	9	10	170	A	03/05/2022	3
Passed	Passed	Light Yellow	Passed	Passed	Passed	0.27	11	10	168	A	04/05/2022	4
Passed	Passed	Yellow	Passed	Passed	Passed	0.2	10	10	167	A	05/05/2022	5
Passed	Passed	Yellow	Passed	Passed	Passed	0.29	12.5	10	169	A	06/05/2022	6
Passed	Passed	Yellow	Passed	Passed	Passed	0.27	11.5	10	171	A	07/05/2022	7
Passed	Passed	Yellow	Passed	Passed	Passed	0.4	13.5	10	174	A	08/05/2022	8
Passed	Passed	Yellow	Passed	Passed	Passed	0.42	14.5	10	170	A	09/05/2022	9
Passed	Passed	Yellow	Passed	Passed	Passed	0.43	15	10	172	A	10/05/2022	10
Passed	Passed	Light brown	Passed	Passed	Passed	0.39	17	10	170	A	11/05/2022	11
Passed	Passed	Light brown	Passed	Passed	Passed	0.37	16	10	168	A	12/05/2022	12
Passed	Passed	Brown	Passed	Passed	Passed	0.34	12	10	161	A	13/05/2022	13
Passed	Passed	Brown	Passed	Passed	Passed	0.36	14	10	174	A	14/05/2022	14
Passed	Passed	Brown	Passed	Passed	Passed	0.39	16	10	172	A	15/05/2022	15
Passed	Passed	Brown	Passed	Passed	Passed	0.43	17	10	173	A	16/05/2022	16
Passed	Passed	Brown	Passed	Passed	Passed	0.47	18	10	167	A	17/05/2022	17
Passed	Passed	Brown	Passed	Passed	Passed	0.43	16	10	168	A	18/05/2022	18
Passed	Passed	Brown	Passed	Passed	Passed	0.42	17	10	175	A	19/05/2022	19
Passed	Passed	Brown	Passed	Passed	Passed	0.34	15	10	176	A	20/05/2022	20

Restaurant - Yifat - Israel- December 2022- January 2023													
Meets the standard	Smell	Color	Sediments(משקעים)	Frying	Clarity (צלילות)	FFA%	TPM After filter 08.30	TPM Before filter- 23.30	Mixing time - in minutes	Temp. (CELSIUS)	Experime Sample Z/A	Date	Day Of Filtration
Information - the restaurant's oil is changed every 3 working days - it becomes black and frothy - an example of the oil after 3 days of frying without a Beyond													
Failed	Failed	Black	Failed	Failed	Failed		1.43	24		175	Z	23/12/2022	1.1
Beginning of an experiment with Beyond Oil - adding powder at night in a special pot - measuring the night before and in the morning after filtering													
Passed	Passed	Light Yellow	Passed	Passed	Passed	0.18	6			173	0	24/12/2022	1
Passed	Passed	Light Yellow	Passed	Passed	Passed	0.07	5.5	6	5	171	A	25/12/2022	2
Passed	Passed	Light Yellow	Passed	Passed	Passed	0.16	7.5	8.5	30	172	A	26/12/2022	3
Passed	Passed	Light Yellow	Passed	Passed	passed	0.23	10	13.5	30	179.1	A	27/12/2022	4
Passed	Passed	Light Yellow	Passed	Passed	Passed	0.23	13.5	14.5	120	175	A	28/12/2022	5
Passed	Passed	Light Yellow	Passed	Passed	Passed	0.27	14	17.5	30	174	A	29/12/2022	6
Passed	Passed	Light Yellow	Passed	Passed	Passed	0.6	14.5	18.5	חצי דקה	170	A	30/12/2022	7
Passed	Passed	Yellow	Passed	Passed	Passed	0.35	16	17	1	166	A	31/12/2022	8
Passed	Passed	Yellow	Passed	Passed	Passed	0.44	13.5	18.5	30	167	A	01/01/2023	9
Passed	Passed	Yellow	Passed	Passed	Passed	0.47	14.5	17	30	172	A	02/01/2023	10
Passed	Passed	Yellow	Passed	Passed	Passed	0.52	16	19.5	30	172	A	03/01/2023	11
Passed	Passed	Yellow	Passed	Passed	Passed	0.5	15	18.5	30	178	A	04/01/2023	12
Passed	Passed	Yellow	Passed	Passed	Passed	0.56	15	18.5	30	165	A	05/01/2023	13
Passed	Passed	Golden Yellow	Passed	Passed	Passed	0.63	14	19	30	175	A	06/01/2023	14
Passed	Passed	Golden Yellow	Passed	Passed	Passed	0.51	15.5	18	30	163	A	07/01/2023	15

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

Restaurant - Ifat - Israel- July 2022												
Meets the standard	Smell	Color	Sediments (משקעים)	Frying	Clarity (צלילות)	FFA%	TPM After filter 08.30	Mixing time in minutes	Temp. (CELSIUS)	Experiment Sample Z/A	Date	Day Of Filtration
Information - the restaurant's oil is changed every 3 working days - it becomes black and frothy - an example of the oil after 3 days of frying without a Beyond Oil filter powder												
Failed	Failed	Black	Failed	Failed	Failed	1.65	24		170	Z		1.1
Beginning of an experiment with Beyond Oil - Filtering with a filtering machine, armadillo type												
Passed	Passed	Light Yellow	Passed	Passed	Passed	0.09	6.8	10	161	0	26/06/2022	1
Passed	Passed	Light Yellow	Passed	Passed	Passed	0.11	7.4	10	174	A	27/06/2022	2
Passed	Passed	Light	Passed	Passed	Passed	0.13	7.9	10	172	A	28/06/2022	3
Passed	Passed	Light Yellow	Passed	Passed	Passed	0.18	9	10	173	A	05/06/2022	4
Passed	Passed	Yellow	Passed	Passed	Passed	0.2	10	10	175	A	06/06/2022	5
Passed	Passed	Yellow	Passed	Passed	Passed	0.17	11	10	176	A	07/06/2022	6
Passed	Passed	Yellow	Passed	Passed	Passed	0.22	12	10	172	A	08/06/2022	7
Passed	Passed	Yellow	Passed	Passed	Passed	0.26	14	10	170	A	09/06/2022	8
Passed	Passed	Yellow	Passed	Passed	Passed	0.29	14.5	10	168	A	10/06/2022	9
Passed	Passed	Yellow	Passed	Passed	Passed	0.32	13.5	10	174	A	11/06/2022	10
Passed	Passed	Light brown	Passed	Passed	Passed	0.39	15	10	172	A	12/06/2022	11
Passed	Passed	Light brown	Passed	Passed	Passed	0.37	16	10	173	A	13/06/2022	12
Passed	Passed	Brown	Passed	Passed	Passed	0.33	14	10	167	A	14/06/2022	13
Passed	Passed	Brown	Passed	Passed	Passed	0.35	12.5	10	168	A	15/06/2022	14
Passed	Passed	Brown	Passed	Passed	Passed	0.39	14	10	175	A	16/06/2022	15
Passed	Passed	Brown	Passed	Passed	Passed	0.42	17	10	176	A	17/06/2022	16
Passed	Passed	Brown	Passed	Passed	Passed	0.44	15	10	172	A	18/06/2022	17
Passed	Passed	Brown	Passed	Passed	Passed	0.38	17	10	170	A	19/06/2022	18
Passed	Passed	Brown	Passed	Passed	Passed	0.39	17	10	168	A	20/06/2022	19
Passed	Passed	Brown	Passed	Passed	Passed	0.33	15	10	172	A	21/06/2022	20
Passed	Passed	Brown	Passed	Passed	Passed	0.38	15	10	171	A	22/06/2022	21
Passed	Passed	Brown	Passed	Passed	Passed	0.39	15	10	170	A	23/06/2022	22
Passed	Passed	Brown	Passed	Passed	Passed	0.36	17	10	168	A	24/06/2022	23

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

References

1. Research Professor Nissim Garti, The Hebrew University of Jerusalem June 2023

A revolution in the frying industry: Beyond Oil's innovative solution May reduce the risk of related types of cancer To reuse oils for frying**,**

2. Medical opinion Health, Prof. Oren Fruchter , MD Director The Pulmonary Division Wolfson Medical Center Tel-Aviv University September 2023:

risks of occupational exposure to frying oil and the innovative solution for reducing cancer morbidity caused by this exposure using Beyond-Oil technology.

3. Anthony Newman Taylor, Paul Cullinan, Paul Blanc and Anthony Pickering. Parkes' Occupational Lung Disorders, Fourth Edition (p. 430). CRC Press. Kindle Edition.

4. Baird, W. M., L. A. Hooven, and B. Mahadevan. 2005. Carcinogenic polycyclic aromatic hydrocarbon-DNA adducts and mechanism of action. Environ. Mol. Mut. 45 (2–3):110–114.

5. Bhurosy T, Marium A, Karaye IM, Chung T. Where there are fumes, there may be lung cancer: a systematic review on the association between exposure to cooking fumes and the risk of lung cancer in never-smokers. Cancer Causes Control. 2023 Jun; 34(6):509-520. doi: 10.1007/s10552-023-01686-y. Epub 2023 Apr 8. PMID: 37031313.

6. Chen, Y. C., C. P. Chiu, and B. H. Chen. 2003. Mutagenicity of fumes from fried chicken legs. J. Food Prot. 66:1269–1276. doi:10.4315/0362-028X66.7.1269.

7. Ganesan K, Sukalingam K, Xu B. Impact of consumption of repeatedly heated cooking oils on the incidence of various cancers- A critical review. Crit Rev Food Sci Nutr. 2019; 59(3):488-505. doi: 10.1080/10408398.2017.1379470. Epub 2017 Oct 20. PMID: 28925728. doi:10.1002/mc.20194.

Hageman, G., R. Hermans, F. ten Hoor, and J. Kleinjans. 1990. Mutagenicity of deep-frying fat, and evaluation of urine mutagenicity after consumption of fried potatoes. Food Chem. Toxicol. 28 (2):75–80. doi:10.1016/0278-6915(90)90013-D.

8. IARC. 2010a. Some non-heterocyclic polycyclic aromatic hydrocarbons and some related exposures. Monographs on the evaluation of carcinogenic risks to humans, vol. 92:853.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

9. Konings, E. J., A. J. Baars, J. D. van Klaveren, M. C. Spanjer, P. M. Rensen, M. Hiemstra, J. A. van Kooij, and P. W. Peters. 2003. Acrylamide exposure from foods of the Dutch population and an assessment of the consequent risks. Food Chem. Toxicol. 41 (11):1569–1579. doi:10.1016/ S0278-6915(03)00187-X.

10. Lipworth, L., J. S. Sonderman, R. E. Tarone, and J. K. McLaughlin. 2012. Review of epidemiologic studies of dietary acrylamide intake and the risk of cancer. Eur. J. Cancer Prev. 21 (4):375–386. doi:10.1097/ CEJ.0b013e3283529b64.

11. Metayer C, Wang Z, Kleinerman RA, Wang L, Brenner AV, Cui H, Cao J, Lubin JH. Cooking oil fumes and risk of lung cancer in women in rural Gansu, China. Lung Cancer. 2002 Feb; 35(2):111-7. doi: 10.1016/s0169-5002(01)00412-3. PMID: 11804682.

12. Murray and Nadel. Textbook of Respiratory Medicine. 7th Edition

13. Rifai L, Saleh FA. A Review on Acrylamide in Food: Occurrence, Toxicity, and Mitigation Strategies. Int J Toxicol. 2020 Mar/Apr; 39(2):93-102. doi: 10.1177/1091581820902405. Epub 2020 Feb 4. PMID: 32013673.

14. Rota, M., Bosetti, C., Boccia, S., Boffetta, P. and La Vecchia, C. 2014a. Occupational exposures to polycyclic aromatic hydrocarbons and respiratory and urinary tract cancers: An updated systematic review and a meta-analysis to 2014. Arch Toxicol 88: 1479– 90. Rota, M., Bosetti, C., Boccia, S., Boffetta, P. and La Vecchia, C. 2014b. Occupational exposures to polycyclic aromatic hydrocarbons and respiratory and urinary tract cancers: An updated systematic review and a meta-analysis to 2014. Arch Toxicol 88(8): 1479– 90.

15. Srivastava, S., M. Singh, J. George, K. Bhui, and Y. Shukla. 2010b. Genotoxic and carcinogenic risks associated with the consumption of repeatedly boiled sunflower oil. J. Agric. Food Chem. 58 (20):11179–11186. doi:10.1021/jf102651n.

16. Straif K, Baan R, Grosse Y, Secretan B, El Ghissassi F, Cogliano V; WHO International Agency for Research on Cancer Monograph Working Group. Carcinogenicity of household solid fuel combustion and of high-temperature frying. Lancet Oncol. 2006 Dec; 7(12):977-8. doi: 10.1016/s1470-2045(06)70969-x. PMID: 17348122.

17. Sun K, Song Y, He F, Jing M, Tang J, Liu R. A review of human and animals exposure to polycyclic aromatic hydrocarbons: Health risk and adverse effects, photo-induced toxicity and regulating effect of microplastics. Sci Total Environ. 2021 Jun 15;773:145403. doi: 10.1016/j.scitotenv.2021.145403. Epub 2021 Jan 28. PMID: 33582342.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

18. Impact of consumption of repeatedly heated cooking oils on the incidence of various cancers- A critical review, Article *in* Critical Reviews in Food Science and Nutrition · April 2019

19. Abdel-Shafy, H. I., and M. S. M. Mansour. 2016. A review on polycyclic aromatic hydrocarbons: Source, environmental impact, effect on human health and remediation. Egyptian J. Petroleum 25:107–123 doi:10.1016/j.ejpe.2015.03.011.

20. Abdullah, A., M. S. Suondoh, C. S. Xuan, N. Abdul Patah, K. Mokhtar, N. A. Mohd Fahami, Q. H. M. Saad, K. Yusof, and K. Jaarin. 2015. Awareness regarding the usage of repeatedly heated cooking oil in Kuala Lumpur, Malaysia. Int. Med. J. 17 (4):310–311.

21. Adam, S. K., N. A. Sulaiman, A. G. Mat Top, and K. Jaarin. 2007. Heating reduces vitamin E content in palm and soy oils. Malays. J. Biochem. Mol. Biol. 15 (2):76–79.

22. Adam, S. K., I. N. Soleiman, N. A. Umar, N. Mokhtar, N. Mohamed, and K. Jaarin. 2008. Effects of repeatedly heated palm oil on serum lipid profile: Lipid peroxidation and homocysteine levels in a postmenopausal rat model. Mcgill J. Med. 11:145–151.

23. Agbaria, R., A. Gabarin, A. Dahan, and S. Ben-Shabat. 2015. Anticancer activity of Nigella sativa (black seed) and its relationship with the thermal processing and quinone composition of the seed. Drug Des. Devel. Ther. 9:3119–3124.

24. Aladedunye, F. A., and R. Przybylski. 2009. Degradation and nutritional quality changes of oil during frying. J. Am. Oil Chem. Soc. 86:149–156. doi:10.1007/s11746-008-1328-5.

25. Alıa, M., S. Ramos, R. Mateos, A. B. Granado-Serrano, L. Bravo, and L. Goya. 2006. Quercetin protects human hepatoma HepG2 against oxidative stress induced by tert-butyl hydroperoxide. Toxicol. Appl. Pharmacol. 212 (2):110–118. doi:10.1016/j.taap.2005.07.014.

26. American Oil Chemists' Society. 2006. Technical Committee of the Institute of Shortening and Edible Oils, Inc: Food fats and oils. 9th ed. 1750 New York Avenue, NW, Suite 120 Washington, DC on the Internet at http://www.iseo.org/foodfats.htm

27. Anand, R. G., M. Alkadri, C. J. Lavie, and R. V. Milani. 2008. The role of fish oil in arrhythmia prevention. J. Cardiopulm. Rehabil. Preven. 28:92–98. doi:10.1097/01.HCR.0000314202.09676.f0.

28. Ansorena, D., A. Guembe, T. Mendizabal, and I. Astiasaran. 2010. Effect of fish and oil nature on frying process and nutritional product quality. J. Food Sci. 75 (2):H62–67. doi:10.1111/j.1750-3841.2009.01472.x.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

29. Azman, A., S. Mohd Shahrul, S. X. Chan, A. P. Noorhazliza, M. Khairunnisak, M. F. Nur Azlina, H. M. Qodriyah, Y. Kamisah, and K. Jaarin. 2012. Level of knowledge, attitude and practice of night market food outlet operators in Kuala Lumpur regarding the usage of repeatedly heated cooking oil. Med. J. Malaysia 67 (1):97–107.

30. Baird, W. M., L. A. Hooven, and B. Mahadevan. 2005. Carcinogenic polycyclic aromatic hydrocarbon-DNA adducts and mechanism of action. Environ. Mol. Mut. 45 (2–3):110–114.

31. Bastida, S., and F. J. Sanchez-Muniz. 2002. Polar content vs. TAG oligomer content in the frying life assessment of monounsaturated and polyunsaturated oils used in deep-frying. J. Am. Oil Chem. Soc. 79 (5):447– 451. doi:10.1007/s11746-002-0504-8.

32. Belitz, H.-D., W. Grosch, and P. Schieberle. 2004. Food chemistry. 3rd ed. Berlin: Springer-Verlag. pp. 218–219.

33. Bosetti, C., R. Talamini, F. Levi, E. Negri, S. Franceschi, L. Airoldi, and C. La Vecchia. 2002. Fried foods: A risk factor for laryngeal cancer? Br. J. Cancer 87 (11):1230–1233. doi:10.1038/sj.bjc.6600639.

34. Bostr€om, C. E., P. Gerde, A. Hanberg, B. Jernstr€om, C. Johansson, T. Kyrklund, A. Rannug, M. T€ornqvist, K. Victorin, and R. Westerholm. 2002. Cancer risk assessment, indicators, and guidelines for polycyclic aromatic hydrocarbons in the ambient air. Environ. Health Perspect. 110 (Suppl 3):451–488. doi:10.1289/ehp.02110s3451.

35. Brenes, M., A. Garci€aa, M. C. Dobarganes, J. Velasco, and C. N. Romero. 2002. Influence of thermal treatments simulating cooking processes on the polyphenol content in virgin olive oil. J. Agric. Food Chem. 50:5962–5967. doi:10.1021/jf020506w.

36. Butler, L. M., R. Sinha, R. C. Millikan, C. F. Martin, B. Newman, M. D. Gammon, A. S. Ammerman, and R. S. Sandler. 2003. Heterocyclic amines, meat intake, and association with colon cancer in a population-based study. Am. J. Epidemiol. 157:434–445. doi:10.1093/aje/ kwf221.

37. Cai, Y., J. Lv, W. Zhang, and L. Zhang. 2012. Dietary exposure estimates of 16 polycyclic aromatic hydrocarbons (PAHs) in Xuanwei and Fuyuan, counties in a high lung cancer incidence area in China. J. Environ. Monit. 14 (3):886–892. doi:10.1039/c2em10807k.

38. Calder, P. C. 2012. Mechanisms of action of (n-3) fatty acids. J. Nutr. 142:592S–599S. doi:10.3945/jn.111.155259.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

39. Cao, W., Y. Wan, Z. H. Liang, Y. Y. Duan, X. Liu, Z. M. Wang, Y. Y. Liu, J. Zhu, X. T. Liu, and H. X. Zhang. 2010. Heated lipiodol as an embolization agent for transhepatic arterial embolization in VX2 rabbit liver cancer model. Eur. J. Radiol. 73 (2):412–419. doi:10.1016/j. ejrad.2008.11.001.

40. Cao, W., X. Xu, J. Zhang, and Y. Duan. 2013. Tumor angiogenesis after heated lipiodol infusion via the hepatic artery in a rabbit model of VX2 liver cancer. PLoS One 8 (4):e61583. doi:10.1371/journal.pone.0061583.

41. Carrasco-Pancorbo, A., L. Cerretani, A. Bendini, A. Segura-Carretero, G. Lercker, and A. Ferna€andez-Gutie€arrez. 2007. Evaluation of the influence of thermal oxidation on the phenolic composition and on the antioxidant activity of extra-virgin olive oils. J. Agric. Food Chem. 55:4771– 4780.https://doi.org/10.1021/jf070186m.

42. Catsburg, C., R. S. Kim, V. A. Kirsh, C. L. Soskolne, N. Kreiger, and T. E. Rohan. 2015. Dietary patterns and breast cancer risk: A study in 2 cohorts. Am. J. Clin. Nutr. 101 (4):817–823.https://doi.org/10.3945/ ajcn.114.097659.

43. Cavalieri, E. L., and E. G. Rogan. 1996. Central role of radical cations in metabolic activation of polycyclic aromatic hydrocarbons. Xenobiotica 25:677–688. doi:10.3109/00498259509061885.

44. Chang, L. W., W. S. Lo, and P. Lin. 2005. Trans, trans-2,4-decadienal, a product found in cooking oil fumes, induces cell proliferation and cytokine production due to reactive oxygen species in human bronchial epithelial cells. Toxicol. Sci. 87 (2):337–343. doi:10.1093/toxsci/kfi258.

45. Chang, Y. C., and P. Lin. 2008. Trans, trans-2,4-decadienal induced cell proliferation via p27 pathway in human bronchial epithelial cells. Toxicol. Appl. Pharmacol. 228 (1):76–83. doi:10.1016/j.taap.2007.11.028.

46. Charles, I. O., and N. A. Adaku. 2010. Polycyclic aromatic hydrocarbons (PAHs) and benzene, toluene, ethylbenzene, and xylene (BTEX) contamination of soils in automobile mechanic workshops in Port-Harcourt Metropolis, Rivers State, Nigeria. J. Am. Sci. 6 (9):242–246.

47. Chen, H., M. Yang, and S. Ye. 1992. A study on genotoxicity of cooking fumes from rapeseed oil. Biomed. Environ. Sci. 5 (3):229–235.

48. Chen, J. W., S. L. Wang, D. P. H. Hsieh, H. H. Yang and H. L. Lee. 2012. Carcinogenic potencies of polycyclic aromatic hydrocarbons for backdoor neighbours of restaurants with

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

cooking emissions. Sci. Total Environ. 417–418:68–75. doi:10.1016/j.scitotenv.2011.12.012.

49. Chen, Y. C., C. P. Chiu, and B. H. Chen. 2003. Mutagenicity of fumes from fried chicken legs. J. Food Prot. 66:1269–1276. doi:10.4315/0362-028X66.7.1269.

50. Cherng, S. H., K. H. Huang, S. C. Yang, T. C. Wu, J. L. Yang, and H. Lee. 2002. Human 8-oxoguanine DNA glycosylase 1 mRNA expression as an oxidative stress exposure biomarker of cooking oil fumes. J. Toxicol. Environ. Health A. 65 (3–4):265–278. doi:10.1080/15287390252800855.

51. Chiang, T. A., P. F. Wu, L. S. Ying, L. F. Wang, and Y. C. Ko. 1999a. Mutagenicity and aromatic amine content of fumes from heated cooking

52. oils produced in Taiwan. Food Chem. Toxicol. 37 (2–3):125–134. doi:10.1016/S0278-6915(98)00081-7.

53. Chiang, T. A., P. F. Wu, and Y. C. Ko. 1999b. Identification of carcinogens in cooking oil fumes. Environ. Res. 81 (1):18–22. doi:10.1006/ enrs.1998.3876.

54. Chiang, T. A., P. F. Wu, L. F. Wang, H. Lee, C. H. Lee, and Y. C. Ko. 1997. Mutagenicity and polycyclic aromatic hydrocarbon content of fumes from heated cooking oils produced in Taiwan. Mutat. Res. 381 (2):157– 161. doi:10.1016/S0027-5107(97)00163-2.

55. Choe, E., and D. B. Min. 2007. Chemistry of deep-fat frying oils. J. Food Sci. 72:R77–R86. doi:10.1111/j.1750-3841.2007.00352.x.

56. Conney, A. H., R. L. Chang, X. X. Cui, M. Schiltz, H. Yagi, D. M. Jerina, and S. J. Wei. 2001. Dose-dependent differences in the profile of mutations induced by carcinogenic (R,S,S,R) bay- and fjord-region diol epoxides of polycyclic aromatic hydrocarbons. Adv. Exp. Med. Biol. 500:697–707. doi:10.1007/978-1-4615-0667-6_102.

57. Cottet, V., M. Touvier, A. Fournier, M. S. Touillaud, L. Lafay, F. Clavel-Chapelon, and M. C. Boutron-Ruault. 2009. Postmenopausal breast cancer risk and dietary patterns in the E3N-EPIC prospective cohort study. Am. J. Epidemiol. 170 (10):1257–1267. doi:10.1093/aje/kwp257.

58. D'Avanzo, B., E. Negri, A. Gramenzi, S. Franceschi, F. Parazzini, P. Boyle, and C. La Vecchia. 1991. Fats in seasoning and breast cancer risk: An Italian case-control study. Eur. J. Cancer 27:420–423. doi:10.1016/ 0277-5379(91)90376-O.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

59. Dai, Q., X. O. Shu, F. Jin, Y. T. Gao, Z. X. Ruan, and W. Zheng. 2002. Consumption of animal foods, cooking methods, and risk of breast cancer. Cancer Epidemiol. Biomarkers Prev. 11 (9):801–808.

60. Das, U. N. 2008. Essential fatty acids and their metabolites could function as endogenous HMG-CoA reductase and ACE enzyme inhibitors, antiarrhythmic, antihypertensive, antiatherosclerotic, anti-inflammatory, cytoprotective, and cardioprotective molecules. Lipids Health Dis. 7:37. doi:10.1186/1476-511X-7-37.

61. Datta, K., and J. Biswas. 2009. Influence of dietary habits, physical activity and affluence factors on breast cancer in East India: A case-control study. Asian Pac. J. Cancer Prev. 10 (2):219–222.

62. Demonly, I., Y. M. Chan, D. Pelled, and P. J. Jones. 2006. Fishoil esters of plant sterols improve the lipid profile of dyslipidemic subjects more than do fish-oil or sunflower oil esters of plant sterols. Am. J. Clin. Nutr. 84:1534–1542.

63. De Marzo, A. M., E. A. Platz, S. Sutcliffe, J. Xu, H. Gronberg, C. G. Drake, Y. Nakai, W. B. Isaacs, and W. G. Nelson. 2007. Inflammation in prostate carcinogenesis. Nat Rev Cancer 7 (4):256–269. doi:10.1038/ nrc2090.

64. De Stefani, E., A. Ronco, M. Mendilaharsu, M. Guidobono, and H. DeneoPellegrini. 1997. Meat intake, heterocyclic amines, and risk of breast cancer: A case-control study in Uruguay. Cancer Epidemiol. Biomark. Prev. 6:573–581.

65. Diniz, Y. S., A. C. Cicogna, C. R. Padovani, L. S. Santana, L. A. Faine, and E. L. Novelli. 2004. Diets rich in saturated and polyunsaturated fatty acids: metabolic shifting and cardiac health. Nutrition 20 (2):230–234.

66. Dobargarnes, M. C., and G. Marquez-Ruiz. 1998. Regulation of used frying fats and validity of quick tests for discarding the fats. Grasas Aceites 49 (3–4):331–335. doi:10.3989/gya.1998.v49.i3-4.735.

67. Dost, K., and C. Ideli. 2012. Determination of polycyclic aromatic hydrocarbons in edible oils and barbecued food by HPLC/UV–Vis
detection. Food Chem. 133:193–199. doi:10.1016/j.foodchem.2012.01.001.

68. Duan, X., G. Shen, H. Yang, J. Tian, F. Wei, J. Gong, and J. J. Zhang. 2016. Dietary intake polycyclic aromatic hydrocarbons (PAHs) and associated cancer risk in a cohort of Chinese urban adults: Inter- and intraindividual variability. Chemosphere 144:2469–2475. doi:10.1016/j. chemosphere.2015.11.019.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

69. Dung, C. H., S. C. Wu, and G. C. Yen. 2006. Genotoxicity and oxidative stress of the mutagenic compounds formed in fumes of heated soybean oil, sunflower oil, and lard. Toxicol. In Vitro 20 (4):439–447. doi:10.1016/j.tiv.2005.08.019.

70. Eder, K., and M. Kirchgessner. 1998. The effect of dietary vitamin E supply and a moderately oxidized oil on activities of hepatic lipogenic enzymes in rats. Lipids. 33 (3):277–283. doi:10.1007/s11745-998-0206-x.

71. Elangovan, I., S. Thirugnanam, A. Chen, G. Zheng, M. C. Bosland, A. Kajdacsy-Balla, and M. Gnanasekar. 2012. Targeting receptor for advanced glycation end products (RAGE) expression induces apoptosis and inhibits prostate tumor growth. Biochem. Biophys. Res. Commun. 417 (4):1133–1138. doi:10.1016/j.bbrc.2011.12.060.

72. Endo, J., and M. Arita. 2016. Cardioprotective mechanism of omega-3 polyunsaturated fatty acids. J. Cardiol. 67 (1):22–27. doi:10.1016/j. jjcc.2015.08.002.

73. European Federation for the Science, Technology of Lipids. 2013. 7th international symposium on deep-fat frying. Optimum drying for safe and improved quality fried foods practical information for the foodservice and industrial frying [San Francisco].

74. Fahy, E., S. Subramaniam, R. C. Murphy, M. Nishijima, C. R. Raetz, T. Shimizu, F. Spener, G. van Meer, M. J. Wakelam, and E. A. Dennis. 2009. Update of the LIPID MAPS comprehensive classification system for lipids. J. Lipid Res. 50 (Suppl):S9–S14. doi:10.1194/jlr. R800095-JLR200.

75. Falade, A. O., G. Oboh, and A. L. Okoh. 2017. Potential health implications of the consumption of thermally-oxidized cooking oils – a review. Pol. J. Food Nutr. Sci. 67 (2):95–105.

Falade, A. O., and G. Oboh. 2015. Thermal oxidation induces lipid peroxidation and changes in the physicochemical properties and b; -carotene content of Arachis oil. Int. J. Food Sci. 2015:806524. doi:10.1155/2015/ 806524.

76. Favero, A., M. Parpinel, and S. Franceschi. 1998. Diet and risk of breast cancer: Major findings from an Italian case-control study. Biomed. Pharmacother. 52:109–115. doi:10.1016/S0753-3322(98) 80088-7.

77. Foster, R., C. S. Williamson, and J. Lunn. 2009. BRIEFING PAPER: Culinary oils and their health effects. Nutr. Bull. 34:4–47 doi:10.1111/ j.1467-3010.2008.01738.x.

78. Galeone, C., C. Pelucchi, R. Talamini, F. Levi, C. Bosetti, E. Negri, S. Franceschi, and C. La Vecchia. 2005. Role of fried foods and oral/pharyngeal and oesophageal cancers. Br. J. Cancer. 92 (11):2065–2069. doi:10.1038/sj.bjc.6602542.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

79. Galeone, C., R. Talamini, F. Levi, C. Pelucchi, E. Negri, A. Giacosa, M. Montella, S. Franceschi, and C. La Vecchia. 2007. Fried foods, olive oil and colorectal cancer. Ann. Oncol. 18 (1):36–39 doi:10.1093/annonc/ mdl328.

80. Ghorbani, Z., A. Hekmatdoost, H. E. Zinab, S. Farrokhzad, R. Rahimi, R. Malekzadeh, and A. Pourshams. 2015. Dietary food groups intake and cooking methods associations with pancreatic cancer: A case-control study. Indian J. Gastroenterol. 34 (3):225–232. doi:10.1007/s12664-0150573-4.

81. Goburdhun, D., S. B. Jhaumeer-Laulloo, and R. Musruck. 2001. Evaluation of soybean oil quality during conventional frying by FTIR and some chemical indexes. Int. J. Food Sci. Nutr. 52:31–42. doi:10.1080/ 09637480020027183.

82. Gonzales, J. F., N. D. Barnard, D. J. Jenkins, A. J. Lanou, B. Davis, G. Saxe, and S. Levin. 2014. Applying the precautionary principle to nutrition and cancer. J. Am. Coll. Nutr. 33:239–246. doi:10.1080/07315724.2013.866527.

83. Good, J. 2012. Healthiest cooking oil chart with smoke points and Omega 3- Fatty acids Ratios: Baseline of Health Foundation. https://jonbarron.org/diet-and-nutrition/healthiest-cooking-oil-chart-smoke-points

84. Gotoh, N., H. AI-Iwasawa Watanabe, R. Osato, and S. Wada. 2007. Oxidation of fats and oils in instant noodles stored under various conditions. J. Food Lipids. 14:350–365. doi:10.1111/j.1745-4522.2007.00091.x.

85. Goya, L., R. Mateos, and L. Bravo. 2007. Effect of the olive oil phenol hydroxytyrosol on human hepatoma HepG2 cells. Protection against oxidative stress induced by tert-butylhydroperoxide. Eur. J. Nutr. 46 (2):70–78. doi:10.1007/s00394-006-0633-8.

86. Grandgirard, A., J. L. Sebedio, and J. Fleury. 1984. Geometrical isomerization of linolenic acid during heat-treatment of vegetable-oils. J. Am. Oil Chem. Soc. 61:1563–1568. doi:10.1007/BF02541633.

87. Guillen, M. D., and P. S. Uriarte. 2012. Aldehydes contained in edible oils of a very different nature after prolonged heating at frying temperature: Presence of toxic oxygenated a,b; unsaturated aldehydes. Food Chem. 131 (3):915–926. doi:10.1016/j.foodchem.2011.09.079.

88. Gupta, M. K. 2005. Frying oil. In: Edible oil and food products: Products and applications, ed. F. Shahidi, 1–31. Hoboken, NJ, USA: John Wiley & Sons.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

89. Gupta, R. C., and W. K. Lutz. 1999. Background DNA damage for endogenous and unavoidable exogenous carcinogens: A basis for spontaneous cancer incidence? Mutat. Res. 424:1–8.

90. Guthrie, H. A. and M. F. Pcciano. 1995. Human nutrition. Boston, MA7 WCB/ McGraw Hill, p. 419.

91. Hageman, G., R. Hermans, F. ten Hoor, and J. Kleinjans. 1990. Mutagenicity of deep-frying fat, and evaluation of urine mutagenicity after consumption of fried potatoes. Food Chem. Toxicol. 28 (2):75–80. doi:10.1016/0278-6915(90)90013-D.

92. Hageman, G., H. Verhagen, B. Schutte, and J. Kleinjans. 1991. Biological effects of short-term feeding to rats of repeatedly used deep-frying fats in relation to fat mutagen content. Food Chem. Toxicol. 29 (10):689– 698. doi:10.1016/0278-6915(91)90127-S.

93. Hanf, V., and U. Gonder. 2005. Nutrition and primary prevention of breast cancer: Foods, nutrients and breast cancer risk. Eur. J. Obstet. Gynecol. Reprod. Biol. 123 (2):139–149. doi:10.1016/j.ejogrb.2005.05.011.

94. Hartung, R. W., H. Brune, G. Grimmer, P. Germann, J. Timm, and W. Wosniok. 1990. Evaluation of the carcinogenic potency of 4 environmental polycyclic aromatic compounds following intrapulmonary application in rats. Exp. Pathol. 40:221–227. doi:10.1016/S0232-1513 (11)80302-6.

95. Healy, D. A., F. A. Wallace, E. A. Miles, P. C. Calder, and P. Newsholm. 2000. Effect of low-to-moderate amounts of dietary fish oil on neutrophil lipid composition and function. Lipids 35:763–768. doi:10.1007/ s11745-000-0583-1.

96. Henkler, F., K. Stolpmann, and A. Luch. 2012. Exposure to polycyclic aromatic hydrocarbons: Bulky DNA adducts and cellular responses. EXS. 101:107–131.

97. Hori, H., T. Takayanagi, Y. Kamada, S. Shimoyoshi, Y. Ono, Y. Kitagawa, H. Shibata, M. Nagao, W. Fujii, and Y. Sakakibara. 2011. Genotoxicity evaluation of sesamin and episesamin. Mutat Res. 719 (1–2):21–28. doi:10.1016/j.mrgentox.2010.10.001.

98. Houthuijzen, J. M. 2016. For better or worse: FFAR1 and FFAR4 signaling in cancer and diabetes. Mol. Pharmacol. 90 (6):738–743. doi:10.1124/ mol.116.105932.

99. Huang, C., X. Zhang, Z. Qiao, L. Guan, S. Peng, J. Liu, R. Xie, and L. Zheng. 1992. A case-control study of dietary factors in patients with lung cancer. Biomed. Environ. Sci. 5 (3):257–265.

100. Hu, F. B. and W. C. Willett. 2002. Optimal diets for prevention of coronary heart disease. JAMA 288 (20):2569–2578.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

101. Hughes-Fulford, M., C. F. Li, J. Boonyaratanakornkit, and S. Sayyah. 2006. Arachidonic acid activates phosphatidylinositol 3-kinase signaling and induces gene expression in prostate cancer. Cancer Res. 66 (3):1427– 1433. doi:10.1158/0008-5472.CAN-05-0914.

102. Hung, H. S., W. J. Wu, Y. W. Cheng, T. C. Wu, K. L. Chang, and H. Lee. 2007. Association of cooking oil fumes exposure with lung cancer: Involvement of inhibitor of apoptosis proteins in cell survival and proliferation in vitro. Mutat Res. 628 (2):107–116. doi:10.1016/j. mrgentox.2006.12.005.

103. IARC. 2010. Some non-heterocyclic polycyclic aromatic hydrocarbons and some related exposures. Monographs on the evaluation of carcinogenic risks to humans, vol. 92:853.

104. IARC. 2012. Monographs on the evaluation of carcinogenic risks to humans. A review of human carcinogens: Radiation, Lyon, France, vol. 100D:341. Available at: http://monographs.iarc.fr/ENG/Monographs/ vol100D/mono100D.pdf

105. Imaida, K., M. S. Lee, C. Y. Wang, and C. M. King. 1991. Carcinogenicity of dinitro pyrenes in the weanling female CD rat. Carcinogenesis, 12:1187–1191. doi:10.1093/carcin/12.7.1187.

106. Imaida, K., C. Uneyama, H. Ogasawara, S. Hayashi, K. Fukuhara, N. Miyata, and M. Takahashi. 1992. Induction of colon adenocarcinomas in CD rats and lung adenomas in ICR mice by 6-nitrochrysene: Comparison of carcinogenicity and aryl hydrocarbon hydroxylase induction in the target organs of each species. Cancer Res. 52:1542–1545.

107. Isidori, M., and A. Parrella. 2009. Genotoxicity of aqueous extract from heated cooking oils and its suppression by Lactobacilli. Food Sci. Technol. Int. 15 (3):267–273 doi:10.1177/1082013209341424.

108. Jahren, A. H., and B. A. Schubert. 2010. Corn content of French fry oil from national chain vs. small business restaurants. Proc. Natl. Acad. Sci. USA. 107 (5):2099–2101. doi:10.1073/pnas.0914437107.

109. Jakobsen, M. U., K. Overvad, J. Dyerberg, M. Schroll, and B. L. Heitmann. 2004. Dietary fat and risk of coronary heart disease: possible effect modification by gender and age. Am. J. Epidemiol. 160:141–149.

110. Ji, B. T., Chow, W. H., Gridley, G., Mclaughlin, J. K., Dai, Q., Wacholder, S., Hatch, M. C., Gao, Y. T., and Fraumeni, J. F. Jr. 1995. Dietary factors and the risk of

pancreatic cancer: A case-control study in Shanghai China. Cancer Epidemiol. Biomarkers Prev. 4 (8):885–893.

111. Jørgensen, R. B., B. Strandberg, A. K. Sjaastad, A. Johansen, and K. Svendsen. 2013. Simulated restaurant cook exposure to emissions of PAHs, mutagenic aldehydes, and particles from frying bacon. J. Occup. Environ. Hyg. 10:122–131. doi:10.1080/15459624.2012.755864.

112. Joshi, A. D., R. Corral, C. Catsburg, J. P. Lewinger, J. Koo, E. M. John, S. A. Ingles, and M. C. Stern. 2012. Red meat and poultry, cooking practices, genetic susceptibility and risk of prostate cancer: Results from a multiethnic case-control study. Carcinogenesis 33 (11):2108–2118 doi:10.1093/carcin/bgs242.

113. Kasamatsu, T., R. Ogura, N. Ikeda, O. Morita, K. Saigo, H. Watabe, Y. Saito, and H. Suzuki. 2005. Genotoxicity studies on dietary diacylglycerol (DAG) oil. Food Chem Toxicol. 43 (2):253–260. doi:10.1016/j. fct.2004.10.001.

114. Katragadda, H. R., A. S. Fullana, S. Sidhu, and A. A. Carbonell-Barrachina. 2010. Emissions of volatile aldehydes from heated cooking oils. Food Chem. 120:59–65. doi:10.1016/j.foodchem.2009.09.070.

115. Kelavkar, U. P., J. Hutzley, K. McHugh, K. G. Allen, and A. Parwani. 2009. Prostate tumor growth can be modulated by dietarily targeting the 15lipoxygenase-1 and cyclooxygenase-2 enzymes. Neoplasia 11 (7):692– 699. doi:10.1593/neo.09334.

116. Kim, D. J., K. K. Lee, B. S. Han, B. Ahn, J. H. Bae, and J. J. Jang. 1994. Biphasic modifying effect of indole-3-carbinol on diethylnitrosamineinduced preneoplastic glutathione S-transferase placental form-positive liver cell foci in Sprague-Dawley rats. Jpn J Cancer Res. 85 (6):578–583.

117. doi:10.1111/j.1349-7006.1994.tb02399.x.

118. Kitamura, K., R. Shibata, Y. Tsuji, M. Shimano, Y. Inden and T. Murohara. 2011. Eicosapentaenoic acid prevents atrial fibrillation associated with heart failure in a rabbit model. Am. J. Physiol. Heart Circ. Physiol. 300: H1814–H1821. doi:10.1152/ajpheart.00771.2010.

119. Klein, V., V. Chajes, E. Germain, G. Schulgen, M. Pinault, D. Malvy, T. Lefrancq, A. Fignon, O. Le Floch, C. Lhuillery, and P. Bougnoux. 2000. Low a-linolenic acid content of adipose breast tissue is associated with an increased risk of breast cancer. Eur. J Cancer 36 (3):335–340. doi:10.1016/S0959-8049(99)00254-3.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

120. Ko, Y. C., L. S. Cheng, C. H. Lee, J. J. Huang, M. S. Huang, E. L. Kao, H. Z. Wang, and H. J. Lin. 2000. Chinese food cooking and lung cancer in women nonsmokers. Am. J . Epidemiol. 151 (2):140–147. doi:10.1093/ oxfordjournals.aje.a010181.

121. Ko, Y. C., C. H. Lee, M. J. Chen, C. C. Huang, W. Y. Chang, H. J. Lin, H. Z. Wang, and P. Y. Chang. 1997. Risk factors for primary lung cancer among non-smoking women in Taiwan. Int. J. Epidemiol. 26 (1):24–31. doi:10.1093/ije/26.1.24.

122. Kohlmeier, L., N. Simonsen, P. van't Veer, J. J. Strain, J. M. Martin-Moreno, B. Margolin, J. K. Huttunen, N. J. Fernandez-Crehuet, B. C. Martin, M. Thamm, A. F. Kardinaal, and F. J. Kok. 1997. Adipose tissue trans fatty acids and breast cancer in the European community multicenter study on antioxidants, myocardial infarction, and breast cancer. Cancer Epidemiol. Biomark. Prev. 6:705–710.

123. Kojima, R., E. Okada, S. Ukawa, M. Mori, K. Wakai, C. Date, H. Iso, and A. Tamakoshi. 2017. Dietary patterns and breast cancer risk in a prospective Japanese study. Breast Cancer 24 (1):152–160. doi:10.1007/s12282016-0689-0.

124. Konings, E. J., A. J. Baars, J. D. van Klaveren, M. C. Spanjer, P. M. Rensen, M. Hiemstra, J. A. van Kooij, and P. W. Peters. 2003. Acrylamide exposure from foods of the Dutch population and an assessment of the consequent risks. Food Chem. Toxicol. 41 (11):1569–1579. doi:10.1016/ S0278-6915(03)00187-X.

125. Korsh, J., A. Shen, K. Aliano, and T. Davenport. 2015. Polycyclic aromatic hydrocarbons and breast cancer: A review of the literature. Breast Care (Basel). 10 (5):316–318. doi:10.1159/000436956.

126. Ku, S. K., M. S. M. Ruhaifi, S. S. Fatin, M. Saffana, K. T. Anna, S. Das, and J. Kamsiah. 2014. The harmful effects of consumption of repeatedly heated edible oils: A short review. Clin. Ter. 165 (4):217–222.

127. Lapointe, A., C. Couillard, and S. Lemieux. 2006. Effects of dietary factors on oxidation of low-density lipoprotein particles. J. Nutr. Biochem. 17 (10):645–658. doi:10.1016/j.jnutbio.2006.01.001.

128. Lee, C. H., S. F. Yang, C. Y. Peng, R. N. Li, Y. C. Chen, T. F. Chan, E. M. Tsai, F. C. Kuo, J. J. Huang, H. T. Tsai, Y. H. Hung, H. L. Huang, S. Tsai, and M. T. Wu. 2010. The precancerous effect of emitted cooking oil fumes on precursor lesions of cervical cancer. Int. J. Cancer 127 (4):932–941.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

129. Lee, T., and F. Gany. 2013. Cooking oil fumes and lung cancer: A review of the literature in the context of the U.S. population. J. Immigr. Minor Health. 15 (3):646–652. doi:10.1007/s10903-012-9651-1.

130. Leong, X. F., J. Salimon, M. R. Mustafa, and K. Jaarin. 2012. Effect of repeatedly heated palmolein on blood pressure-regulating enzymes activity and lipid peroxidation in rats. Mal. J. Med. Sci. 19:20–29.

131. Leong, X. F., M. N. M. Najib, S. Das, M. R. Mustafa, and K. Jaarin. 2009. Intake of repeatedly heated palm oil causes elevation in blood pressure with impaired vasorelaxation in rats. Tohoku J. Exp. Med. 219:71–78. doi:10.1620/tjem.219.71.

132. Li, C. T., Y. C. Lin, W. J. Lee, and P. J. Tsai. 2003. Emission of polycyclic aromatic hydrocarbons and their carcinogenic potencies from cooking sources to the urban atmosphere. Environ. Health Perspect. 111:483– 487 doi:10.1289/ehp.5518.

133. Li, J. W., X. G. Wang, and Q. Z. Jin. 2011. The sources, detection, and control of benzo[a]pyrene in edible oil. China Grease 36:7–11.

134. Li, M. L., J. Lin, J. G. Hou, L. Xu, X. G. Cui, X. X. Xu, Y. W. Yu, X. Han, G. M. Wang, J. M. Guo, D. F. Xu, T. C. Thompson, G. W. Cao, and H. W. Zhang. 2014. Environmental and psycho-social factors related to prostate cancer risk in the Chinese population: A case–control study. Biomed. Environ. Sci. 27:707–717.

135. Li, S. G., D. H. Pan, and G. X. Wang. 1992. Analysis of polycyclic aromatic hydrocarbons in cooking oil smoke. Chin. J. Pub. Health 11:235–236.

136. Lin, P. P., M. H. Yang, P. C. Liao, H. Y. Wu, L. W. Chang, H. T. Tsai, and Y. C. Tyan. 2008. Proteomic analysis of proteins associated with ttDDE induced toxicity in BEAS-2B cells. Biochem. Biophys. Res. Commun. 376 (3):519–524. doi:10.1016/j.bbrc.2008.09.020.

137. Lipworth, L., J. S. Sonderman, R. E. Tarone, and J. K. McLaughlin. 2012. Review of epidemiologic studies of dietary acrylamide intake and the risk of cancer. Eur. J. Cancer Prev. 21 (4):375–386. doi:10.1097/ CEJ.0b013e3283529b64.

138. Liu, P., C. D. Holman, J. Jin, and M. Zhang. 2015. Diet and risk of adult leukemia: A multicenter case-control study in China. Cancer Causes Control. 26 (8):1141–1151. doi:10.1007/s10552-015-0608-2.

139. Liu, Q., A. J. Sasco, E. Riboli, and M. X. Hu. 1993. Indoor air pollution and lung cancer in Guangzhou, People's Republic of China. Am. J. Epidemiol. 137 (2):145–154. doi:10.1093/oxfordjournals.aje.a116654.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

140. Lopez-Abente, G., J. M. Sanz-Anquela, and C. A. Gonzalez. 2001. Consumption of wine stored in leather wine bottles and incidence of gastric cancer. Arch. Environ. Health 56:559–561. doi:10.1080/

141. 00039890109602906.

142. Lopez-Garcia, E., M. B. Schulze, J. B. Meigs, J. E. Manson, N. Rifai, M. J. Stampfer, W. C. Willett, and F. B. Hu. 2005. Consumption of transfatty acids is related to plasma biomarkers of inflammation and endothelial dysfunction. J. Nutr. 135:562–566.

143. Luchtenborg, M., M. P. Weijenberg, A. F. de Goeij, P. A. Wark, M. Brink,€ G. M. Roemen, M. H. Lentjes, A. P. de Bru€ıne, R. A. Goldbohm, P. van't Veer, and P. A. van den Brandt. 2005. Meat and fish consumption, APC gene mutations and hMLH1 expression in colon and rectal cancer: A prospective cohort study (The Netherlands). Cancer Causes Control. 16 (9):1041–1054. doi:10.1007/s10552-005-0239-0.

144. Lv, M. Y., X. Zhang, H. R. Ren, L. Liu, Y. M. Zhao, Z. Wang, Z. L. Wu, L. M. Liu, and H. J. Xu. 2016. A rapid method to authenticate vegetable oils through surface-enhanced Raman scattering. Sci Rep. 6:23405. doi:10.1038/srep23405.

145. Marinova, E. M., K. A. Seizova, I. R. Totseva, S. S. Panayotova, I. N. Marekov, and S. M. Momchilova. 2012. Oxidative changes in some vegetable oils during heating at frying temperature. Bulg. Chem. Commun. 44 (1):57–63.

146. Marsili, L., A. Caruso, M. C. Fossi, M. Zanardelli, E. Politi, and S. Focardi. 2001. Polycyclic aromatic hydrocarbons (PAHs) in subcutaneous biopsies of Mediterranean cetaceans. Chemosphere 44:147–154. doi:10.1016/S0045-6535(00)00206-X.

147. Mensah, E., and G. Y. Obeng. 2013. Assessment and projection of waste vegetable oils from hotels for biodiesel feedstock and CO2 savings in Ghana. Int J Engg Res Sci Technol. 2 (4):1–12.

148. Metcalf, R. G., M. J. James, R. A. Gibson, J. R. Edwards, J. Stubberfield, R. Stuklis, K. Roberts-Thomson, G. D. Young, and L. G. Cleland. 2007. Effects of fish-oil supplementation on myocardial fatty acids in humans. Am. J. Clin. Nutr. 85:1222–1228.

149. Mojska, H., I. Gielecinska, L. Szponar, and M. O »tarzewski. 2010. Estimation of the dietary acrylamide exposure of the Polish population. Food Chem. Toxicol. 48 (8–9):2090–2096. doi:10.1016/j.fct.2010.05.009.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

150. Mucci, L. A., H. O. Adami, and A. Wolk. 2006. Prospective study of dietary acrylamide and risk of colorectal cancer among women. Int. J. Cancer 118:169–173. doi:10.1002/ijc.21309.

151. Nakagawa, K., T. Hidaka, M. Kitano, M. Asakura, T. Kamigaito, T. Noguchi, and K. Hosoe. 2008. Genotoxicity studies on licorice flavonoid oil (LFO). Food Chem. Toxicol. 46 (7):2525–2532. doi:10.1016/j. fct.2008.04.008.

152. Navarro, A., S. E. Munoz, M. J. Lantieri, M. del Pilar Diaz, P. E. Cristaldo, S. P. de Fabro, and A. R. Eynard. 2004. Meat cooking habits and risk of colorectal cancer in Cordoba, Argentina. Nutrition 20:873–877. doi:10.1016/j.nut.2004.06.008.

153. Naz, S., R. Siddiqi, H. Sheikh, and S. A. Sayeed. 2005. Deterioration of olive, corn and soybean oils due to air, light, heat, and deep-frying. Food Res. Int. 38:127–134. doi:10.1016/j.foodres.2004.08.002.

154. Neuhouser, M. L., M. J. Barnett, A. R. Kristal, C. B. Ambrosone, I. King, M. Thornquist, and G. Goodman. 2007. (n-6) PUFA increase and dairy foods decrease prostate cancer risk in heavy smokers. J. Nutr. 137 (7):1821–1827. Ng, C. Y., X. F. Leong, N. Masbah, S. K. Adam, Y. Kamisah, and K. Jaarin. 2014a. Heated vegetable oils and cardiovascular disease risk factors, Vasc. Pharmacol. 61:1–9. doi:10.1016/j.vph.2014.02.004.

155. Ng, C. Y., X. F. Leong, N. Masbah, S. K. Adam, Y. Kamisah, and K. Jaarin. 2014b. Reprint of heated vegetable oils and cardiovascular disease risk factors, Vasc. Pharmacol. 62:38–46. doi:10.1016/j.vph.2014.05.003.

156. Ng, C. Y., Y. Kamisah, F. Othman, and K. Jaarin. 2012. The role of repeatedly heated soybean oil in the development of hypertension in rats: Association with vascular inflammation. Int. J. Exp. Pathol. 93:377– 387. doi:10.1111/j.1365-2613.2012.00839.x.

157. Nie, J., J. Shi, X. Duan, B. Wang, N. Huang, and X. Zhao. 2014. Health risk assessment of dietary exposure to polycyclic aromatic hydrocarbons in Taiyuan, China. J. Environ. Sci. (China). 26 (2):432–439. doi:10.1016/ S1001-0742(13)60424-6.

158. Oboh, G., A. O. Falade, and A. O. Ademiluyi. 2014. Effect of thermal oxidation on the physicochemical properties, malondialdehyde and carotenoid contents of palm oil. Riv. Ital. Sostanze Gr. 91 (1):59–65.

159. Ohba, S., M. Nishi, and H. Miyake. 1996. Eating habits and pancreas cancer. Int J Pancreatol. 20 (1):37–42.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

160. Orozco-Solano, M. I., F. Priego-Capote, and M. D. Luque de Castro. 2013. Analysis of esterified and nonesterified fatty acids in serum from obese individuals after intake of breakfasts prepared with oils heated at frying temperature. Anal. Bioanal. Chem. 405 (18):6117–6129. doi:10.1007/ s00216-013-7004-0.

161. Owu, D. U., N. N. Orie, and E. E. Osim. 1997. Altered responses of isolated aortic smooth muscle following chronic ingestion of palm oil diets in rats. Afr. J. Med. Med. Sci. 26:83–86.

162. Pala, V., V. Krogh, P. Muti, V. Chajes, E. Riboli, A. Micheli, M. Saadatian, S. Sieri, and F. Berrino. 2001. Erythrocyte membrane fatty acids and subsequent breast cancer: A prospective Italian study. J. Natl. Cancer Inst. 93:1088–1095. doi:10.1093/jnci/93.14.1088.

163. Pandey, M. K., A. Dhawan, and M. Das. 2006. Induction of p53, p21waf1, ornithine decarboxylase activity, and DNA damage leading to cell-cycle arrest and apoptosis following topical application of repeated fish fried oil extract to mice. Mol. Carcinog. 45:805–813. doi:10.1002/mc.20194.

164. Pandit, G. G., P. K. Srivastava, and A. M. Mohan Rao. 2001. Monitoring of indoor volatile organic compounds and polycyclic aromatic hydrocarbons arising from kerosene cooking fuel. Sci. Total Environ. 279:159– 165 doi:10.1016/S0048-9697(01)00763-X.

165. Pauk, N., S. Klimesova, J. Kara, J. Topinka, and J. Labaj. 2013. The relevance of monitoring of antibodies against the polycyclic aromatic hydrocarbon (PAH) and PAH-DNA adducts in serum in relation to lung cancer and chronic obstructive pulmonary disease (COPD). Neoplasma 60 (2):182–187. doi:10.4149/neo_2013_024.

166. Paul, S., and G. S. Mittal. 1997. Regulating the use of degraded oil/fat in deep-fat/oil food frying. Crit. Rev. Food Sci. Nutr. 37 (7):635–662. doi:10.1080/10408399709527793.

167. Pawlega, J., J. Rachtan, and T. Dyba. 1996. Dietary factors and risk of prostate cancer in Poland. Results of case–control study. Neoplasma 43:61–63.

168. Pellizzari, E. D., L. C. Michael, K. W. Thomas, P. G. Shields, and C. Harris. 1995. Identification of 1,3-butadiene, benzene, and other volatile organics from wok oil emissions. J. Expo. Anal. Environ. Epidemiol. 5 (1):77–87.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

169. Pfau, W., and H. Marquardt. 2001. Cell transformation in vitro by foodderived heterocyclic amines Trp-P-1, Trp-P-2 and N(2)-OH-PhIP. Toxicol. 166:25–30. doi:10.1016/S0300-483X(01)00435-8.

170. Pham, T. M., Y. Fujino, S. Kikuchi, A. Tamakoshi, S. Matsuda, and T. Yoshimura. 2010. Dietary patterns and risk of stomach cancer mortality: The Japan collaborative cohort study. Ann. Epidemiol. 20 (5):356– 363. doi:10.1016/j.annepidem.2010.02.002.

171. Phiri, G., P. Mumba, and A. Mangwera. 2006. The quality of cooking oil used in informal food processing in Malawi: A preliminary study. Int. J. Consum. Stud. 30 (6):527–532. doi:10.1111/j.1470-6431.2006.00513.x.

172. Platt, K. L., E. Pfeiffer, P. Petrovic, H. Friesel, D. Beermann, E. Hecker, and F. Oesch. 1990. Comparative tumorigenicity of picene and dibenz[a,h] anthracene in the mouse. Carcinogenesis, 11:1721–1726. doi:10.1093/ carcin/11.10.1721.

173. Psaltopoulou, T., A. Naska, P. Orfanos, D. Trichopoulos, T. Mountokalakis, and A. Trichopoulou. 2004. Olive oil, the Mediterranean diet, and arterial blood pressure: The Greek European Prospective Investigation into Cancer and Nutrition(EPIC) study. Am. J. Clin. Nutr. 80:1012– 1018.

174. Pu, Y., L. Yin, H. Yuan, and G. Liang. 2002. Oxidative stress of cooking oil fume on rat type II lung cells. Wei Sheng Yan Jiu. 31 (2):85–87.

175. Pulliero, A., R. Godschalk, M. G. Andreassi, D. Curfs, F. J. Van Schooten, and A. Izzotti. 2015. Environmental carcinogens and mutational pathways in atherosclerosis. Int. J. Hyg. Environ. Health. 218 (3):293–312. doi:10.1016/j.ijheh.2015.01.007.

176. Purcaro, G., J. A. Navas, F. Guardiola, L. S. Conte, and S. Moret. 2006. Polycyclic aromatic hydrocarbons in frying oils and snacks. J. Food Prot. 69 (1):199–204. doi:10.4315/0362-028X-69.1.199.

177. Qu, Y. H., G. X. Xu, J. Z. Zhou, T. D. Chen, L. F. Zhu, P. G. Shields, H. W. Wang, and Y. T. Gao. 1992. Genotoxicity of heated cooking oil vapors. Mutat. Res. 298 (2):105–111. doi:10.1016/0165-1218(92)90035-X.

178. Ramesh, S. A., D. B. Walker, M. D. Hood, M. D. Guillen, K. Schneider, and E. H. Weyand. 2004. Bioavailability and risk assessment of orally ingested polycyclic aromatic hydrocarbons. Int. J. Toxicol. 23:301–333. doi:10.1080/10915810490517063.

179. Rojas, M., R. Godschalk, K. Alexandrov, I. Cascorbi, E. Kriek, J. Ostertag, F. J. Van Schooten, and H. Bartsch. 2001. Myeloperoxidase–463A variant reduces

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

benzo[a]pyrene diol epoxide DNA adducts in skin of coal tar treated patients. Carcinogenesis 22 (7):1015–1018. doi:10.1093/ carcin/22.7.1015.

180. Romero, A., S. Bastida, and F. J. Sanchez-Muniz. 2006. Cyclic fatty acid monomer formation in domestic frying of frozen foods in sunflower oil and high oleic acid sunflower oil without oil replenishment. Food Chem. Toxicol. 44:1674–1681. doi:10.1016/j.fct.2006.05.003.

181. Ross, J., G. Nelson, G. Erexson, A. Kligerman, K. Earley, R. C. Gupta, and S. Nesnow. 1991. DNA adducts in rat lung, liver and peripheral blood lymphocytes produced by i.p. administration of benzo[a]pyrene metabolites and derivatives. Carcinogenesis 12:1953–1955. doi:10.1093/ carcin/12.10.1953.

182. Ross, J., G. Nelson, A. Kligerman, G. Erexson, M. Bryant, K. Earley, R. Gupta, and S. Nesnow. 1990. Formation and persistence of novel benzo (a)pyrene adducts in rat lung, liver, and peripheral blood lymphocyte DNA. Cancer Research 50:5088–5094.

183. Sadoudi, R., A. Ammouche, and A. D. Ali. 2014. Thermal oxidative alteration of sunflower oil. Afr. J. Food Sci. 8 (3):116–121 doi:10.5897/ AJFS12.112.

184. Sayon-Orea, C., S. Carlos, and M. A. Martınez-Gonzalez. 2015. Does cooking with vegetable oils increase the risk of chronic diseases?: A systematic review. Br. J. Nutr. 113 (Suppl 2):S36–48. doi:10.1017/ S0007114514002931.

185. See, S. W., and R. Balasubramanian. 2008. Chemical characteristics of fine particles emitted from different gas cooking methods. Atmos. Environ. 42:8852–8862 doi:10.1016/j.atmosenv.2008.09.011.

186. Seow, A., W. T. Poh, M. Teh, P. Eng, Y. T. Wang, W. C. Tan, M. C. Yu, and H. P. Lee. 2000. Fumes from meat cooking and lung cancer risk in Chinese women. Cancer Epidemiol. Biomarkers Prev. 9 (11):1215–1221.

187. Shields, P. G., G. X. Xu, W. J. Blot, J. F. Fraumeni Jr, G. E. Trivers, E. D. Pellizzari, Y. H. Qu, Y. T. Gao, and C. C. Harris. 1995. Mutagens from heated Chinese and U.S. cooking oils. J. Natl. Cancer Inst. 87 (11):836–841.

188. Shukla, Y., A. Arora, and P. Taneja. 2003. Antigenotoxic potential of certain dietary constituents. Teratog. Carcinog. Mutagen 1:323–335. doi:10.1002/tcm.10059.

189. Shukla, Y., and A. Arora. 2003. Enhancing effects of mustard oil on preneoplastic hepatic foci development in Wistar rats. Hum. Exp. Toxicol. 22 (2):51–55. doi:10.1191/0960327103ht338oa.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

190. Shukla, Y., N. Kalra, S. Katiyar, I. A. Siddiqui, and A. Arora. 2004. Chemopreventive effect of indole-3-carbinol on induction of preneoplastic altered hepatic foci. Nutr. Cancer. 50 (2):214–220. doi:10.1207/ s15327914nc5002_12.

191. Sinha, R., W. H. Chow, M. Kulldorff, J. Denobile, J. Butler, M. Garcia-Closas, R. Weil, R. N. Hoover, and N. Rothman. 1999. Well-done, grilled red meat increases the risk of colorectal adenomas. Cancer Res. 59:4320–4324.

192. Sinha, R., M. Kulldorff, W. H. Chow, J. Denobile, and N. Rothman. 2001. Dietary intake of heterocyclic amines, meat derived mutagenic activity, and risk of colorectal adenomas. Cancer Epidemiol. Biomarkers Prev. 10:559–562.

193. Sinha, R., D. R. Gustafson, M. Kulldorff, W. Q. Wen, J. R. Cerhan, and W. Zheng. 2000. 2-Amino-1-methyl-6-phenylimidazo[4,5-b]pyridine, a carcinogen in high-temperature-cooked meat, and breast cancer risk. J. Natl. Cancer Inst. 92:1352–1354. doi:10.1093/jnci/92.16.1352.

194. Siti, K. A., D. Srijit, N. S. Ima, A. U. Nor, and J. Kamsiah. 2008. Consumption of repeatedly heated soy oil increases the serum parameter related to atherosclerosis in ovariectomized rats. Tohoku J. Exp. Med. 215:219– 226 doi:10.1620/tjem.215.219.

195. Somi, M. H., S. M. Mousavi, S. Naghashi, E. Faramarzi, M. A. Jafarabadi, M. Ghojazade, A. Majidi, and S. A. Naseri Alavi. 2015. Is there any relationship between food habits in the last two decades and gastric cancer in North-Western Iran? Asian Pac. J. Cancer Prev. 16 (1):283–290. doi:10.7314/APJCP.2015.16.1.283.

196. Soriguer, F., G. Rojo-Martinez, M. C. Dobarganes, J. M. Garcıa- Almeida, I. Esteva, M. Beltran, M. S. Ruiz De Adana, F. Tinahones, J. M. GomezZumaquero, E. Garcıa-Fuentes, and S. Gonzalez-Romero. 2003. Hypertension is related to the degradation of dietary frying oils. Am. J. Clin. Nutr. 78:1092–1097.

197. Srivastava, S., M. Singh, J. George, K. Bhui, A. Murari Saxena, and Y. Shukla. 2010a. Genotoxic and carcinogenic risks associated with the dietary consumption of repeatedly heated coconut oil. Br. J. Nutr. 104 (9):1343–1352. doi:10.1017/S0007114510002229.

198. Srivastava, S., M. Singh, J. George, K. Bhui, and Y. Shukla. 2010b. Genotoxic and carcinogenic risks associated with the consumption of repeatedly boiled sunflower oil. J. Agric. Food Chem. 58 (20):11179–11186. doi:10.1021/jf102651n.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

199. Stott-Miller, M., M. L. Neuhouser, and J. L. Stanford. 2013. Consumption of deep-fried foods and risk of prostate cancer. Prostate 73 (9):960– 969. doi:10.1002/pros.22643.

200. Svensson, K., L. Abramsson, W. Becker, A. Glynn, K. E. Hellen€as, Y. Lind, and J. Rosen. 2003. Dietary intake of acrylamide in Sweden. Food Chem. Toxicol. 41 (11):1581–1586. doi:10.1016/S0278-6915(03)00188-1.

201. Takamatsu, S., O. Matsui, T. Gabata, S. Kobayashi, M. Okuda, T. Ougi, Y. Ikehata, I. Nagano, and H. Nagae. 2008. Selective induction hyperthermia following transcatheter arterial embolization with a mixture of nano-sized magnetic particles (ferucarbotran) and embolic materials: Feasibility study in rabbits. Radiat. Med. 26 (4):179–187. doi:10.1007/ s11604-007-0212-9.

202. Takayama, S., Y. Monma, M. Tsubota-Utsugi, S. Nagase, Y. Tsubono, T. Numata, M. Toyoshima, H. Utsunomiya, J. Sugawara, and N. Yaegashi. 2013. Food intake and the risk of endometrial endometrioid adenocarcinoma in Japanese women. Nutr Cancer 65 (7):954–960. doi:10.1080/ 01635581.2013.818158.

203. Tareke, E., P. Rydberg, P. Karlsson, S. Eriksson, and M. Tornqvist. 2002. Analysis of acrylamide, a carcinogen formed in heated foodstuffs. J. Agric. Food Chem. 50 (17):4998–5006 doi:10.1021/jf020302f.

204. Topinka, J., A. Milcova, J. Schmuczerova, M. Mazac, M. Pechout, and M. Vojtisek-Lom. 2012. Genotoxic potential of organic extracts from particle emissions of diesel and rapeseed oil powered engines. Toxicol. Lett. 212 (1):11–17. doi:10.1016/j.toxlet.2012.04.017.

205. Totani, N., C. Ohno, and A. Yamaguchi. 2006. Is the frying oil in deep-fried foods safe? J. Oleo. Sci. 55 (9):449–456. doi:10.5650/ jos.55.449.

206. Tung, Y. H., J. L. Ko, Y. F. Liang, L. Yin, Y. Pu, and P. Lin. 2001. Cooking oil fume-induced cytokine expression and oxidative stress in human lung epithelial cells. Environ. Res. 87 (1):47–54. doi:10.1006/ enrs.2001.4272.

207. Uribarri, J., W. Cai, M. Peppa, S. Goodman, L. Ferrucci, G. Striker, and H. Vlassara. 2007. Circulating glycotoxins and dietary advanced glycation endproducts: Two links to inflammatory response, oxidative stress, and aging. J. Gerontol. Biol. Sci. Med. Sci. 62 (4):427–433. doi:10.1093/ gerona/62.4.427.

208. Uribarri, J., S. Woodruff, S. Goodman, W. Cai, X. Chen, R. Pyzik, A. Yong, G. E. Striker, and H. Vlassara. 2010. Advanced glycation end products in foods and a

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

practical guide to their reduction in the diet. J. Am. Diet Assoc. 110 (6):911–16.e12. doi:10.1016/j.jada.2010.03.018.

209. Vaskova, H., and M. Buckova. 2015. Thermal degradation of vegetable oils: Spectroscopic measurement and analysis. Procedia Eng. 100:630–635. doi:10.1016/j.proeng.2015.01.414.

210. Velema, J. P., A. Ferrera, M. Figueroa, R. Bulnes, L. A. Toro, O. de Barahona, J. M. Claros, and W. J. Melchers. 2002. Burning wood in the kitchen increases the risk of cervical neoplasia in HPV-infected women in Honduras. Int J Cancer 97 (4):536–541. doi:10.1002/ijc.1622.

211. Wakabayashi, K. 1990. International commission for protection against environmental mutagens and carcinogens. ICPEMC Working Paper 7/ 1/3. Animal studies suggesting involvement of mutagen/carcinogen exposure in atherosclerosis. Mutat. Res. 239:181–187. doi:10.1016/ 0165-1110(90)90005-V.

212. Williams, G. M., M. J. Aardema, P. H. Long, E. D. Thompson, and G. S. Allgood. 1996. Genotoxicity and subchronic toxicity studies with heated olestra. Food Chem Toxicol. 34 (10):941–950. doi:10.1016/ S0278-6915(96)00055-5.

213. Wornat, M. J., E. B. Ledesma, A. K. Sandrowitz, M. J. Roth, S. M. Dawsey, Y. L. Qiao, and W. Chen. 2001. Polycyclic aromatic hydrocarbons identified in soot extracts from domestic coal-burning stoves of Henan Province, China. Environ. Sci. Technol. 35:1943–1952 doi:10.1021/ es001664b.

214. Wu, P. F., T. A. Chiang, L. F. Wang, C. S. Chang, and Y. C. Ko. 1998. Nitro-polycyclic aromatic hydrocarbon contents of fumes from heated cooking oils and prevention of mutagenicity by catechin. Mutat. Res. 403 (1–2):29–34. doi:10.1016/S0027-5107(98)00015-3.

215. Wu, S. C., and G. C. Yen. 2004. Effects of cooking oil fumes on the genotoxicity and oxidative stress in human lung carcinoma (A-549) cells. Toxicol In Vitro 18:571–580. doi:10.1016/j.tiv.2004.01.004.

216. Wu, S. C., G. C. Yen, and F. Sheu. 2001. Mutagenicity and identification of mutagenic compounds of fumes obtained from heating peanut oil. J. Food Prot. 64 (2):240–245. doi:10.4315/0362-028X-64.2.240.

217. Yao, Z., J. Li, B. Wu, X. Hao, Y. Yin, and X. Jiang. 2015. Characteristics of PAHs from deep-frying and frying cooking fumes. Environ. Sci. Pollut. Res. Int. 22 (20):16110–16120. doi:10.1007/s11356-015-4837-4.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

218. Young, S. C., L. W. Chang, H. L. Lee, L. H. Tsai, Y. C. Liu, and P. Lin. 2010. DNA damages induced by trans, trans-2,4-decadienal (tt-DDE), a component of cooking oil fume, in human bronchial epithelial cells. Environ. Mol. Mutagen. 51 (4):315–321.

219. Zhang, H., G. Wang, and W. Tan. 2002. Study on the effects of cooking oil fume condensate on the DNA integrity. Wei Sheng Yan Jiu. 31 (4):238– 240.

220. Zhang, L., J. Lv, and C. Liao. 2012. Dietary exposure estimates of 14 trace elements in Xuanwei and Fuyuan, two high lung cancer incidence areas in China. Biol. Trace Elem. Res. 146 (3):287–292. doi:10.1007/s12011011-9252-1.

221. Zhao, Y., S. X. Wang, K. Aunan, H. M. Seip, and J. M. Hao. 2006. Air pollution and lung cancer risks in China—a meta-analysis. Sci. Total Environ. 366:500–513. doi:10.1016/j.scitotenv.2005.10.010.

222. Zheng, W., W. J. Blot, X. O. Shu, E. L. Diamond, Y. T. Gao, B. T. Ji, and J. F. Fraumeni Jr. 1992. Risk factors for oral and pharyngeal cancer in Shanghai, with emphasis on diet. Cancer Epidemiol. Biomarkers Prev. 1 (6):441–448.

223. Zheng, W., D. R. Gustafson, R. Sinha, J. R. Cerhan, D. Moore, C. P. Hong, K. E. Anderson, L. H. Kushi, T. A. Sellers, and A. R. Folsom. 1998.

224. Well-done meat intake and the risk of breast cancer. J. Natl. Cancer Inst. 90:1724–1729. doi:10.1093/jnci/90.22.1724.

225. Zhong, L., M. S. Goldberg, Y. T. Gao, and F. Jin. 1999a. Lung cancer and indoor air pollution arising from Chinese-style cooking among nonsmoking women living in Shanghai, China. Epidemiol. 10 (5):488–494. doi:10.1097/00001648-199909000-00005.

226. Zhong, L., M. S. Goldberg, M. E. Parent, and J. A. Hanley. 1999b. Risk of developing lung cancer in relation to exposure to fumes from Chinesestyle cooking. Scand. J. Work Environ. Health. 25 (4):309–316. doi:10.5271/sjweh.440.

227. Zock, P. L., and M. B. Katan. 1998. Linoleic acid intake and cancer risk: A review and meta-analysis. Am. J. Clin. Nutr. 68:142–153.

228. *Chung KT (2013) The Etiology of Bladder Cancer and its Prevention. J Cancer Sci Ther 5: 346-361. doi:10.4172/1948-5956.1000226*

229. Pan CH et al, Effect on chinese restaurant workers of exposure to cocking oil fumes: a cautionary note on urinary 8 hydroxy 2 deoxyguanosine. Cancer epidemiol biomarkers prev. 17, 12, 3351-7, 2008.

Prof. Sarel Halahmi
Head of Urology Department Bnei Zion Medical Center
Full Clinical Professor – Rappaport Faculty of Medicine
He holds the Dr. Natalie Sheffer Chair in Clinical and Applied Cancer Research
Technion Israel Institute of Technology
Mobile: 050-6267394
מייל: sarel.halachmi@b-zion.org.il

230. *Lai CH et al. Exposure to coocking oil fumes and oxidative damage: a longitudinal study in Chinese military cooks. Journal of exposure science and environmental epidemiology, 23, 94-100, 2013.*

231. *Gensean K et al, Impact of consumption of repeatedly heated cooking oil on the incidence of various cnacers a critical review. Critical reviews in food science and nutrition 2017 http://dx.doi.org/10.1080/10408398.2017.1379470*

232. *Kunze E, et al. Life style and occupational risk factors for bladder cancer in Germany, a case controlled study. Cancer 69, 1776-1790, 1992.*

233. *Colt JS et al, occupation and bladder cancer risk in a population based case control study in new Hampshire. Cancer cause control 15,8,759-69,2004*.

234. *Chiang TA et al. Mutagenicity and aromatic amine content of fumes from heated cooking oil products in Taiwan. Food chem toxicol 37,2-3,125-34,1999.*

235. *Dolin PJ et al, Occupation and bladder cancer: a death certificate study. Br. J cancer. 66,568-578,1992.*

236. *Rahman HH,et al, Association of chronic kidney disease with exposure to polycyclic aromatic hydrocarbons in the US population. Environmental science and pollution research. 29'24024-34, 2022.*

237. *Kakavandi B, et al. Establishing the relationship between polycystic aromatic hydrocarbons (PAHS) exposure and male infertility. A systematic review. Ecotoxicology and environmental safety 250, 114485, 1-19, 2023*.

238.