Reducing Industrially Produced Trans Fatty Acids in Pakistan
Reducing Industrially Produced Trans Fatty Acids in Pakistan

All rights reserved.

All rights reserved. No part of this paper may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopying, recording or information storage and retrieval system, without prior written permission of the publisher.

A publication of the Sustainable Development Policy Institute (SDPI). The opinions expressed in the papers are solely those of the authors, and publishing them does not in any way constitute an endorsement of the opinion by the SDPI.

Sustainable Development Policy Institute is an independent, non-profit research institute on sustainable development.

First edition: January 2024
© 2024 by the Sustainable Development Policy Institute

Mailing Address:
PO Box 2342, Islamabad, Pakistan
Telephone: 0092-51-2278134, 2278136, 2277146, 2270674-76
Fax: 0092-51-2278135,
URL: www.sdpi.org
Reducing Industrially Produced Trans Fatty Acids in Pakistan

Authors

Vaqar Ahmed
Fatima Muzammil
Tahira Siddique
Asma Elahi
Yahya Gulraiz
Table of Contents

Introduction 1
Background and Rationale 2
Methodology 4
iTFA Situation in Pakistan 5
  iTFA content in food 5
  Key iTFA regulations 5
Key iTFA regulations in Pakistan 6
Key Findings 7
Recommendations 9
Conclusion 12
References 13

List of Tables

Table 1: Food Products and TFA Range 5
Table 2: Key iTFA regulations in Pakistan 6
Table 3: Policy Recommendations 9
## List of Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHD</td>
<td>Coronary Heart Disease</td>
</tr>
<tr>
<td>CVDs</td>
<td>Cardiovascular Diseases</td>
</tr>
<tr>
<td>DALYs</td>
<td>Disability-Adjusted Life Years</td>
</tr>
<tr>
<td>GBD</td>
<td>Global Burden of Disease</td>
</tr>
<tr>
<td>IFA</td>
<td>Islamabad Food Authority</td>
</tr>
<tr>
<td>IHD</td>
<td>Ischemic Heart Disease</td>
</tr>
<tr>
<td>IHME</td>
<td>Institute for Health Metrics and Evaluation</td>
</tr>
<tr>
<td>iTFA</td>
<td>Industrially Produced Trans Fatty Acids</td>
</tr>
<tr>
<td>KP</td>
<td>Khyber Pakhtunkhwa</td>
</tr>
<tr>
<td>MNFSR</td>
<td>Ministry of National Food Security and Research</td>
</tr>
<tr>
<td>MoNHSR&amp;C</td>
<td>Ministry of National Health Services, Regulations &amp; Coordination</td>
</tr>
<tr>
<td>NCDs</td>
<td>Non-Communicable Diseases</td>
</tr>
<tr>
<td>PCSIR</td>
<td>Pakistan Council of Scientific and Industrial Research</td>
</tr>
<tr>
<td>PFA</td>
<td>Punjab Food Authority</td>
</tr>
<tr>
<td>PHO</td>
<td>Partially Hydrogenated Oils</td>
</tr>
<tr>
<td>PMAS-AAUR</td>
<td>Pir Mehr Ali Shah Arid Agriculture University</td>
</tr>
<tr>
<td>PSQCA</td>
<td>Pakistan Standards and Quality Control Authority</td>
</tr>
<tr>
<td>TFA</td>
<td>Trans Fatty Acids</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organization</td>
</tr>
</tbody>
</table>
Acknowledgement

We extend sincere appreciation to the Ministry of National Food Security and Research (MnFSR) for their invaluable support in the development of this policy brief. Dr Abid Qaiyum Suleri, Usman Qayyum, Saram Bokhari, Dipanwita Chakraborty, Nabila Kidwai, and Dr Razia Safdar supported this effort. The usual disclaimer applies.
Introduction

The Global Burden of Disease (GBD) study produced by a consortium of US universities provides a comprehensive picture of mortality and disability across countries, time, age, and sex. There is a significant impact of dietary risks (fifth on the list) for human morbidity, mortality, and DALYs lost (IHME 2019). Trans fats, particularly industrially produced Trans Fatty Acids, are an essential component of global diets and a risk factor for coronary heart diseases. According to WHO (2023) 573,000 deaths were attributed to increase intake of TFA including 7.7% coronary heart disease mortality. The World Health Organization (WHO) recommended bringing down the dietary content of trans fats to a minimum of 2gm/100gm fat (2%) or less than 1% of total energy from 2000 calories/day and guided countries for regulatory and other interventions.

Trans fats are classified mainly into unsaturated and saturated fats, deriving from both plant and animal sources. Unsaturated fats, liquid at room temperature, are found in plant-derived foods like vegetable oils, nuts, and seeds. Examples include olive, canola, sunflower, and peanut oils as well as pumpkin, flaxseeds, and various nuts (Harvard School of Public Health 2018). Saturated fats, solid at room temperature, are primarily extracted from animal sources such as whole milk, cheese, beef (tallow), and ice cream, with some plant foods like coconut oil, palm oil, and palm kernel oil also being rich in saturated fats (Harvard School of Public Health 2018).

Trans fats naturally occur in meat and dairy products but are predominantly found as industrially produced trans fatty acids (iTFA) in the food supply. iTFAs, or Partially Hydrogenated Oils (PHO), are created through the incomplete hydrogenation of liquid vegetable oils, transforming them into a semi-solid state commonly named as vanaspati ghee in South Asia. This process has been popular since the early 20th century due to the desirable characteristics it imparts to food products, including taste, texture, and shelf life (Rogers 2009; Smith 2010; World Health Organization 2018; American Heart Association 2017). In Pakistan, the per capita consumption of oil is significantly high, and the customary consumption of street and deep-fried foods exacerbates the health risks associated with iTFAs, particularly cardiovascular diseases (Codex Alimentarius Commission 2017).

According to the WHO, Pakistan in 2020 was the second-highest consumer of iTFA in the Eastern Mediterranean Region. Considering the evidence, all government and regulatory stakeholders have moved to a consensus on the need for the elimination of trans fats from Pakistani foods as a public health imperative to reduce the growing NCD burden. To cater such problems industrialists came up with an innovative cost-effective solution of blending, that involved mixing hard and soft oils in a
defined composition to attain the desired characteristics of vanaspati ghee while ensuring minimum production of iTFA in the final product. Similarly, the research and development sector of Pakistan’s ghee/oil industry is also exploring the potential of interesterification that allows the redistribution of the fatty acids in a triglyceride oil over its glycerol moieties effectively altering its properties and helping in iTFA reduction.

Background and Rationale

Pakistan faces a critical health issue due to high consumption of iTFAs with significant consumption through Vanaspati ghee, margarine, and bakery shortenings, contributing to it being the second-highest per capita consumer of iTFA (6% of total energy) in the WHO-Eastern Mediterranean Region. iTFAs’ unsaturated fats that have been industrially hydrogenated to extend shelf life and enhance flavour stability are found across various foods processed in Pakistan. iTFA intake has increased the risk of Non-Communicable Diseases (NCDs), notably Cardiovascular Diseases (CVDs), which are one of the leading causes of death in Pakistan (WHO 2022).

The economic appeal of iTFA-containing products due to their lower cost and longer shelf life further exacerbates the issue, making them a staple in low to middle-income households. Despite the known health risks, public awareness and robust policy actions are lacking to mitigate iTFA consumption. The current regulatory environment is characterized by fragmented policies and weak enforcement, particularly across provincial jurisdictions.

Globally, concerted efforts have been made to eliminate iTFA from the food supply with the WHO calling for a worldwide elimination. Best practice policies, including legislative bans and mandatory limits on iTFA content in food products, have shown promising results in several countries. However, Pakistan’s approach to iTFA regulation has been slow, with varied actions taken at the provincial level but no unified strategy across the federation (WHO 2022).

Addressing this issue across the country requires an understanding of the dietary patterns, socio-economic factors, and current regulatory landscape. It necessitates a concerted effort from various stakeholders, including the government, the food industry, and public health advocates including health sector think tanks, to implement and enforce policies that can effectively reduce iTFA consumption and promote public health.
Methodology

This study has relied on an in-depth literature review, one-on-one and group interviews allowing us to gather information through semi-structured questionnaires, and public-private group discussions with a selected group guided by a moderator. A broad spectrum of scientific papers, minutes of recent meetings at the federal ministry and provincial line departments for health and food, reports by WHO and other development partners, and public sector health-related evidence were reviewed to understand the extent of iTFA consumption and its health implications in Pakistan. This involved analyzing data on dietary habits, iTFA content in commonly consumed foods, and the prevalence of iTFA-related non-communicable diseases, particularly cardiovascular diseases.

Subsequently, an examination of the regulatory landscape focusing on existing food standards, labeling requirements, and iTFA-specific regulations at the national and provincial level was conducted. This was complemented by a comparative analysis of global best practices in iTFA regulation, drawing from successful case studies of countries that have effectively reduced iTFA consumption through legislative and voluntary approaches.

Policy documents and standards by PSQCA, the Ministry of National Food Security and Research, the Ministry of National Health Services, Regulations and Coordination, Punjab, Khyber Pakhtunkhwa, Islamabad, and Gilgit-Baltistan food authorities along with other best practice policy guidelines were consulted.

The personnel of departments and ministries whose in-depth interviews were conducted included: MNFSR, MNHSRC, FAO, Punjab Food Authority, Islamabad Food Authority, federal and provincial Environment Protection Agencies, University of Agriculture Faisalabad, Riphah International University, PMAS-Arid Agriculture University Rawalpindi, University of Haripur, University of Engineering & Technology Peshawar, English Biscuit Manufacturer, IFAD- Scaling Up Nutrition, The Monal Group, World Bank Group, Alltech Pakistan, and Chambers of Commerce and Industry in Islamabad, Rawalpindi, Lahore, and Karachi.
iTFA Situation in Pakistan

iTFA Content in Food

A study providing iTFA content across different products in Pakistan is listed in Table 1. The high iTFA content in these food items indicates a critical public health issue, necessitating urgent interventions to reduce iTFA consumption and promote healthier choices (World Health Organization 2019; Heartfile 2019).

Table 1: Food Products and TFA Range

<table>
<thead>
<tr>
<th>Food Product</th>
<th>Average TFA Range (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vanaspati Ghee</td>
<td>14.2% - 34.3%</td>
</tr>
<tr>
<td>Margarines</td>
<td>11.5% - 34.8%</td>
</tr>
<tr>
<td>Shortenings</td>
<td>7.3% - 31.7%</td>
</tr>
<tr>
<td>Biscuits</td>
<td>9.3% - 34.9%</td>
</tr>
<tr>
<td>Chocolates</td>
<td>4.56% - 8.49%</td>
</tr>
<tr>
<td>Pastries</td>
<td>3.92% - 10.97%</td>
</tr>
<tr>
<td>Parathas</td>
<td>11%</td>
</tr>
<tr>
<td>Cakes</td>
<td>12%</td>
</tr>
<tr>
<td>French fries</td>
<td>0.11% - 24%</td>
</tr>
<tr>
<td>Breakfast cereals</td>
<td>14.4%</td>
</tr>
</tbody>
</table>

Source: (Heartfile 2019)

Studies indicate that a reduction in iTFA consumption to WHO’s recommended standard of 1% per 2000-calorie diet could potentially save 15,000 lives annually in Pakistan (CPDI 2023). High iTFA intake is associated with an increased risk of Ischemic Heart Disease (IHD), with 10.13% of IHD deaths attributed to high iTFA consumption, which is higher than the global average of 8.7% (IHME 2019). According to National Nutrition Survey the consumption of iTFA is also positively correlated with obesity rates, especially alarming given the 7.5% obesity rate among Pakistani adolescents (GOP & UNICEF 2018).

Pakistan has substantial food import requirements. In 2022, the import of edible oils and fats was Pakistan’s second largest import after petroleum products, which amounted to $4.3 billion (ITC, 2023). This reflects the high demand for iTFA-containing products in the country. We discuss in the latter section the need for focused public and private investment to develop and promote alternatives to iTFA’s.

Key iTFA regulations

Federal and provincial government institutions have tried to initiate and implement various iTFA-related regulations (Table 2). These efforts are not without ongoing challenges in enforcement and reaching an understanding with industrial actors.
# Key iTFA Regulations in Pakistan

## Table 2: Key iTFA regulations in Pakistan

<table>
<thead>
<tr>
<th>Organization</th>
<th>Regulations</th>
</tr>
</thead>
</table>
| **National level PSQCA**          | • Approved iTFAs limits are not more than 2g per 100g of fats.  
• Applicable to various food items: Vanaspati, Shortenings, Bakery fats, Bakery ware, Rusk, Bread, and others.  
• Aligned with WHO recommended limit: 1% of total energy intake Equivalent to 2.2g/day in a 2000-calorie diet (WHO, 2023) |
| **The Punjab Food Authority (PFA)** | • Regulations encompassing all major food products linked with Trans Fatty Acids (iTFAs)  
• PFA established the following iTFA limits for 2020:  
  1. 0.5% of total fatty acids for Vanaspati, Shortenings, Margarine and Spreads  
  2. 3% for infant formula, lower than WHO limits.  
• Ban on Vanaspati: Implemented by the PFA (Punjab Food Authority).  
• Now Punjab Food Authority has adopted the harmonized standards of PSQCA as per CASE NO. CCL4/1/2021 (Dated: 07.04.2021). |
| **The KP Food Authority**         | • Previous iTFA Limits:  
  1. 5% for Vanaspati and bakery shortenings  
  2. 3% for infant formula  
• Labeling Requirements: Applicable to creams analogs, table margarine, infant formula, and dried ice cream |
| **The Sindh Food Authority (SFA)** | • Added iTFA Limits: 5% for Vanaspati ghee.  
• Consideration of iTFA Limits: A new scientific panel for the authority considering including iTFA limits for margarine and bakery fats |
| **Balochistan Food Authority**     | • No iTFA-specific regulations in Baluchistan. |
| **The Islamabad Food Authority (IFA)** | • Islamabad Food Authority has adopted the harmonized standards of PSQCA as per the Harmonization Of Food Standards Case No. CCL4/1/2021 (Dated: 07.04.2021).  
• In these harmonized standards, the iTFA limit is set at 2% as per the WHO recommendation. |

Source: (PSQCA 2023; MST 2022, p.4).
Key Findings

After the 18th Constitutional Amendment, Pakistan’s food regulation system was devolved to provincial food authorities who developed their respective regulations along with those of the Pakistan Standards and Quality Control Authority (PSQCA). This led to a varied enforcement capacity across the country, with the Punjab having the most well-developed regulatory system and Balochistan and Gilgit-Baltistan having limited capacities.

At the national level, PSQCA standards, also adopted by Sindh, approved iTFA limits of not more than 2g per 100g of fats in Vanaspati, shortenings, bakery fats, bakery ware, rusk, and bread. These standards aim to align with the WHO-recommended limit of 1% of total energy intake, which translates to 2.2g/day in a diet of 2000 calories.

Though Punjab Food Authority regulations are most comprehensive targeting all iTFA Containing foods, [iTFA Limit 0.5%] but practically followed WHO recommendation of 2%. Another radical/important step was to ban vanaspati by 2020 but it is not fully implemented and needs further enforcement. PFA countered the industry in this regard. It is important to mention that there is no legal definition of trans fat free product. This is the work to be done by food authorities along with PSQCA, ministry of food security and industry.

Review of other provincial standards in place has shown that all sources of iTFAs do not meet WHO-recommended limits. For example, the Khyber Pakhtunkhwa Food Authority had iTFA limits of 5% for Vanaspati and bakery shortenings and 3% for infant formula, and the Sindh Food Authority had added later iTFA limits for Vanaspati ghee [of 5%].

The lack of uniform enforcement and tool capacity building are significant challenges that need to be addressed for effective iTFA regulation and enforcement. This requires deeper cooperation across the federation. The 18th Amendment of decentralization has created friction. Provinces like the Punjab and Sindh actively implemented stricter regulations, while Balochistan and Gilgit-Baltistan lag behind due to weaker infrastructure and lack of financial resources. To counter such limitations, harmonization of standards from PSQCA is being adopted by all food authorities, and uniform enforcement of the 2% iTFA limit is being implemented as notified (MST 2022, p.4).
Reducing Industrially Produced Trans Fatty Acids in Pakistan

A misplaced sense of competition and lack of communication between the ministries like health, food, and trade have delayed progress. Siloed approaches hinder information sharing, especially regarding monitoring and capacity building. Any initiative by the federal government in this space is seen as a violation of devolution by the provinces.

Pressure from industry is also mounting. Powerful groups representing the Vanaspati and bakery fat industries often exert pressure on provincial authorities to relax regulations or delay their implementation. While some industry players are reluctant to embrace stricter regulations, others are aware of the health implications of iTFAs and the growing consumer demand for healthier products. Some large firms have started investing in healthier fat alternatives and they have started advertising about this change. Although we need to adopt alternatives but need to review the industrial processes of iTFA Production like partial hydrogenation (PHO). There are safer industrial processes like interesterification to reduce iTFAs but the industry lacks technology, and expertise for this sophisticated process in addition to high costs. Such efforts need to be recognized by the government.

There are also challenges beyond enforcement. For example, limited public knowledge about the health risks of iTFAs weakens demand for stricter regulations and compliance. The government and think tanks haven’t invested in awareness campaigns to educate consumers and encourage healthier dietary choices. Transitioning to healthier fats is often termed crucial as per media content analysis, but access to affordable alternatives like olive oil remains a challenge for low-income groups. Financial incentives and production subsidies for healthier fat production and distribution are non-existent due to lack of fiscal space in provincial budgets.

The government or large firms could offer transition assistance and incentivize research and development into healthier fat alternatives to mitigate these concerns. Engaging the industry in public-private dialogue might also be more effective than simply imposing regulations and eroding trust.

Provincial food authorities, particularly in budget-constrained provinces, lack the technical expertise and equipment required for proper TFA testing and analysis. Investing in training and infrastructure is crucial for effective enforcement. Such interventions are even absent in provincial annual development programmes.
Our research emphasizes the need to continuously strengthen the iTFA regulatory framework with uniform standards and transparent enforcement mechanisms; promote cross-province, and interdepartmental collaboration, data, and evidence sharing; invest in public awareness campaigns about the health risks of iTFA’s and healthier fat alternatives; support capacity building efforts for provincial food authorities, particularly in resource-constrained provinces; and facilitate dialogue and collaboration with the industry to develop practical solutions for transition and promote the adoption of healthier fats are in table 3 offering institution-wise recommendations.

Table 3: Policy Recommendations

<table>
<thead>
<tr>
<th>Organization</th>
<th>Recommendations</th>
</tr>
</thead>
</table>
| Parliament and Provincial Assembly Members | • Parliamentarians can be champions for improved public health awareness and can be strong resistance against industry lobbying to weaken regulations.  
• Political parties’ own think tanks and relevant teams should have public health awareness and awareness on iTFA related to NCDs and act as agents of change. |
| MNFSR and Provincial Governments | • Allocate budgets for building assessment and monitoring capacity of provincial food authorities.  
• Uniform enforcement of regulations at all provincial levels.  
• Build a consensus on a uniform definition of Trans Fat-Free products.  
• Development of a National Action Plan and inclusion of interventions in the next five-year national plan.  
• Strengthen, fund, and capacitate provincial food authorities to implement regulations.  
• Awareness of policymakers, producers, and retailers on iTFAs and Alternatives.  
• Engage with traders, retailer associations, and chambers of commerce to enable alternative sourcing.  
• Align policies with those of countries in the region with best-practice iTFA policies to facilitate trade and reformulation. |
| MoNHSR&C                  | • Implementation of intersectoral interventions for Universal Health.  
Coverage and proposed policy recommendation for elimination of iTFA are fiscal, regulatory, and information sharing (awareness).  
• Communication strategy for public awareness on harmful effects of iTFA particularly Vanaspati, which is taken as healthy, for this collaboration with the Ministry of Information for effective campaign on electronic and social media. Awareness of policymakers and the food industry on health impacts.  
• Commission and support research on sources and food content and population-level intake of iTFA.  
• Collaboration with Health NGOs for Public Awareness and involvement of health care providers and associations both in the public and private sectors. |
**Reducing Industrially Produced Trans Fatty Acids in Pakistan**

| Ministry of Science & Technology | • PSQCA & PCSIR should undertake research in partnership with producers and research institutions to develop healthier alternatives to PHOs.  
| | • Support for reformulation/alternatives by Small and Medium-sized Enterprises,  
| | • Strengthening laboratory capacities to assess the food content of iTFA;  
| Federal & Provincial Food Authorities | • Ban on Vanaspatis (Phasing out in Punjab).  
| | • Mandatory Labeling of iTFA Content.  
| | • Restrictions on iTFA Use in Food Products.  
| | • Capacity building of Human Resources at food authorities for field inspections and enforcement.  
| | • Comprehensive system of penalization and compliance and penalties for non-compliance.  
| Government Policy & Advocacy | • CCP with Ministry of information should play its role to put checks on misinformation provided in promotional advertisements.  
| | • HEC should support Public Sector Universities for research and advocacy on elimination of iTFA in food supply chain and propose alternatives.  
| | • Strengthen, fund, and capacitate provincial food authorities to implement regulations.  
| | • Political parties’ election campaigns should have public health awareness and awareness on iTFA related to NCDs and act as agents of change.  
| | • Awareness of policymakers, producers, and retailers on iTFAs and Alternatives.  
| Civil Society & Communities SDPI, think tanks, and other civil society partners including media | • Public groups for advocacy on policy implementation: Different social media, electronic and print media groups can be made to have health discussions and updates on current scenarios.  
| | • Public awareness by civil society and community interventions: Public awareness seminars in schools and universities and engagement with Parent Teacher Associations sessions can be conducted to spread awareness and knowledge about iTFA.  
| Non-Government Organizations: Vanaspati Ghee Association) Pakistan Edible Oil Refiners Association (PEORA | • Adopt alternate options.  
| | • Invest in research and development sectors.  
| | • Mapping of informal food industry using resused oil.  
| Chamber of Commerce and Industry (ICCI) | • The CCI should play its part in spreading the message.  
| | • Effectively engage small traders and major stakeholders who are users of ghee.  

Conclusion

The eradication of iTFA from the food supply chain presents a complex challenge influenced by consumer dietary preferences, traditions, and misleading industry advertising. To address these issues, it’s essential to adopt policies and regulations that have proven effective in other countries, such as reducing iTFA content to below 2%, banning Partially Hydrogenated Oils (PHOs), and ensuring transparent labeling of food contents. These measures have demonstrated success in reducing iTFA consumption.

Enhancing public awareness about the health risks associated with iTFA is crucial and requires a coordinated, multifaceted approach involving various stakeholders working in tandem. The strategy should extend beyond mere restrictions and prohibitions to encourage the food industry to embrace and innovate healthier alternatives. This can be achieved by strengthening monitoring systems and building the capacity of food regulatory authorities.

Commitment from the top levels of government, through a multi-sectoral collaboration involving MoNHSR&C and MNFSR, is vital for the implementation of comprehensive policies and inter-sectoral interventions. Engaging public health academia and institutions is essential to advocate for stringent iTFA regulations. The active involvement and political will of policymakers are imperative to enacting and enforcing these health-centric legislations effectively.
References

Ahmed, V, Suleri, AQ, Wahab, MA. and Javed, A 2014, Informal flow of merchandise from India: The case of Pakistan, In India-Pakistan trade: Strengthening economic relations (pp. 47-70), Springer, New Delhi
Codex Alimentarius Commission 2017. Codex Committee on Fats and Oils, FAO/WHO Food Standards Programme, Canada.


