

BALANCING TRADE & CONSUMER PROTECTION: EU & CODEX APPROACHES PESTICIDE RESIDUES & CONTAMINANTS – TÜRKİYE'S PERSPECTIVE

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*Risk Assessment Driving Food Safety: Europe & Latin America, 21-22 May 2026
Spanish Agency for Food Safety and Nutrition (AESAN)*

OUTLINE

- **Pesticides**
- **Why Türkiye's Perspective Matters**
- **From National Approaches to Global Alignment**
- **The Role of Codex Alimentarius**
- **Future Directions and Recommendations**
- **Closing Remarks**

Global Pesticide Usage & Impacts

Sources: FAO Statistical Yearbook 2024, FAOSTAT Pesticides Database, WHO/FAO reports.

- Global pesticide use reached **3.7 million tonnes** of active ingredients in 2023.
- Usage has **doubled since 1990** and increased about **70% since 2000**.
- More than **1,000 pesticide products** are currently in use worldwide.

Environmental & Health Concerns

- Pesticides contaminate **soil, rivers, and groundwater**
- Harm to **pollinators, insects, fish, and wildlife** is increasing globally
- Overuse contributes to **chemical-resistant weeds and pests**
- Improper pesticide management can threaten biodiversity and human health

Pesticides are used to

- Protect crops from insects, weeds, fungi, and diseases
- Prevent **20–40% crop losses** caused by pests and plant diseases
- Support food production for a growing global population

Future Outlook

- Demand for pesticides is expected to remain high due to climate change, population growth, and increasing food demand.
- Governments and organizations such as FAO & WHO are promoting:
 - Sustainable farming
 - Integrated Pest Management (IPM)
 - Reduced chemical dependency
 - Safer pesticide regulations

Hazard Characterization: The Foundation of Risk Assessment

Hazard characterization is a core step within risk assessment, evaluating the nature, severity, and dose–response relationship of adverse health effects caused by a chemical or contaminant.

It establishes health-based guidance values such as:

- ADI (Acceptable Daily Intake)
- ARfD (Acute Reference Dose)
- TDI/TWI (Tolerable Daily/Weekly Intake)

Hazard characterization is essential before exposure and risk characterization, because without toxicological reference values it is not possible to determine whether consumer exposure represents a health concern.

Key tools used in hazard characterization include:

- Toxicological studies (animal and human data)
- Dose–response assessment
- NOAEL and LOAEL approaches
- Benchmark Dose (BMD) modelling
- Uncertainty and safety factors
- In vitro and mechanistic studies

The robustness of hazard characterization directly influences MRL setting, contaminant limits, and overall consumer protection policies.

Importance of Food Production Steps in Hazard Characterization

Food production and processing steps can significantly influence the nature and level of hazards, affecting the toxicity, concentration, or formation of contaminants and residues.

Hazard characterization must consider the entire food chain, including:

- Agricultural practices
- Processing methods
- Storage conditions
- Transport and packaging

Certain production steps may reduce hazards, for example:

- Washing, peeling, cooking, fermentation, or refining can lower pesticide residues or contaminant levels.

Other processes may create or increase hazards, such as:

- Heat treatment forming acrylamide
- Smoking or grilling generating PAHs
- Poor storage increasing mycotoxin formation

Considering production factors improves the realism and accuracy of toxicological assessment, leading to more reliable exposure estimates and more effective risk management decisions.

This is especially important for international trade, because differences in agricultural and processing practices between regions may influence both residue levels and compliance with EU or Codex standards.



WTO SPS SYSTEM In TÜRKİYE

**Türkiye has been a member of WTO since 26 March 1995
&
Member of GATT since 17 October 1951**

**Directorate General for Food & Control (DGFC)
SPS National Notification Authority (NNA)
&
SPS Enquiry Point(s) (NEP)**

**Directorate General for European Union
&
Foreign Affairs**



**SPS&TBT
Platform**

REGULATION ON PESTICIDES MRLs: EU & TÜRKİYE

Resmî Gazete Tarihi: 27.09.2021 Resmî Gazete Sayısı: 31611 Mükerrer

TÜRK GIDA KODEKSİ PESTİSİTLERİN MAKSİMUM KALINTI LİMİTLERİ YÖNETMELİĞİ

EU Regulation 396/2005 on MRLs of pesticides

Annex I	Products covered by the Regulation	Lists all food and feed products for which MRLs may apply. Defines which commodities are subject to MRL controls.
Annex II	Established EU MRLs	Contains definitive EU Maximum Residue Levels (MRLs) for approved pesticide substances.
Annex III <ul style="list-style-type: none">• Part A• Part B	Temporary or Transitional MRLs	Used while additional scientific review or regulatory decisions are ongoing.
Annex IV	Substances Exempt from MRLs	No residue limit needed due to very low toxicological concern.
Annex V	Default MRL	Functions as the EU “limit of determination” in many cases.
Annex VI	Processing Factors	Contains processing factors showing how pesticide residues change during food processing
Annex VII	Fumigation Derogations	Provides temporary derogations for certain post-harvest fumigation treatments used in international trade.

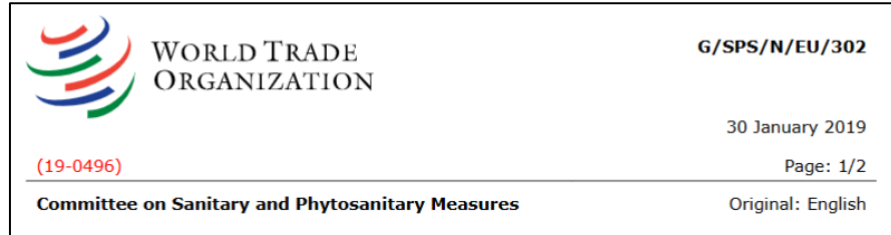
IMPORTANCE OF DATA SHARING /1

Food Safety, Water Disinfection and Trade Intersect

CHLORATE

Not approved

TÜRKİYE'S RATIONALE



Chlorate is not a pesticide residue in the classical sense — it is mainly formed as a *by-product of chlorine-based water disinfection*, an essential practice for food hygiene and public health protection.

Türkiye aligned with EU Regulation 396/2005, although chlorate has never been authorized or used as a pesticide in Türkiye, highlighting the complexity of regulating a contaminant originating from sanitation processes rather than agricultural use.

Scientific and regulatory uncertainty remains significant:

EFSA acknowledged limited data for fresh fruits and vegetables, while MRLs were nevertheless derived using GAP and the ALARA principle. In addition, chlorate levels may vary depending on:


- irrigation water, environmental conditions, season, country, and post-harvest sanitation practices.

The issue creates a difficult balance between food safety and trade:

Chlorinated water remains one of the most effective and widely used disinfection tools worldwide. Therefore, overly restrictive chlorate limits may unintentionally become a *technical barrier to trade*, especially for fresh produce exporters.

6. **Description of content:** The proposed draft Regulation concerns the setting of MRLs for chlorate in or on certain food commodities. The document is at the stage of the feedback mechanism of the EU decision-making process. WTO Members are invited to provide comments already during this process, until 18 February 2019, via the following link:

IMPORTANCE OF DATA SHARING /2



WORLD TRADE ORGANIZATION

G/SPS/N/EU/302/Add.1

16 June 2020

(20-4241) Page: 1/2

Committee on Sanitary and Phytosanitary Measures Original: English

8.6.2020 EN Official Journal of the European Union L 178/7

COMMISSION REGULATION (EU) 2020/749
of 4 June 2020
amending Annex III to Regulation (EC) No 396/2005 of the European Parliament and of the Council
as regards maximum residue levels for chlorate in or on certain products

(Text with EEA relevance)

- **Chlorate is no longer authorized as a pesticide in the EU, and all related plant protection product approvals were withdrawn following its non-inclusion under EU legislation.**
- A default MRL of 0.01 mg/kg applies because chlorate is not listed in Annex IV of Regulation (EC) 396/2005, even though residues are still widely detected in food and drinking water.
- Residues mainly come from chlorine-based disinfectants used in food processing and water treatment, and monitoring data show levels often exceed the default MRL and vary by product and source.

Therefore, the EU introduced temporary MRLs based on the ALARA principle and good manufacturing practices, aiming to balance food safety, hygiene needs, and technical feasibility, with periodic review foreseen.

FALSE POSITIVE RESULTS /1

DITHIOCARBAMATE

Not approved

FOOD ADDITIVES & CONTAMINANTS: PART A
<https://doi.org/10.1080/19440049.2022.2093987>



The false positive effect of residue of sulphur sources on dithiocarbamate analysis based on CS₂ measurement

Sinan Arslan, İlkem Demirkesen Mert, Sema Yiğitkaya, Ozlem Dagaşan, Feridun Nihat Sakallı & Selma Oztürk
Pages 131-140 | Received 12 Sep 2018, Accepted 12 Dec 2018, Published online: 11 Jan 2019

Published: 2019

False positive effect of sulfur sources used in growing and processing of vine (*Vitis Vinifera* L.) leaves on the results of dithiocarbamate analysis based on carbon disulfide measurement

Sinan Arslan^a, Ali Güler^b, Nurdan Güngör^b, Özlem Dağışan^c, Sema Yiğitkaya^a, Leyla Yeşim Kale^d, Eren Numanoğlu^a, Beyza Balaban^a, Kadir Emre Özaltın^b, Özen Merken^b and Güneş Kacar^d

^aMinistry of Agriculture and Forestry, General Directorate of Food and Control, Ankara, Türkiye; ^bMinistry of Agriculture and Forestry, Viticulture Research Institute, Manisa, Türkiye; ^cMinistry of Agriculture and Forestry, Food Control Laboratory Directorate, Antalya, Türkiye; ^dProvincial Directorate of Agriculture and Forestry, Ministry of Agriculture and Forestry, Manisa, Türkiye

- Currently, metiram and ziram are approved for use as pesticides. Active substances in the European Union, while maneb, mancozeb and thiram are not approved.
- Since all the above-mentioned substances were approved before the entry into force of the Regulation (EC) No 396/2005, it is considered that they share a common characteristic of being naturally occurring carbon disulfide (CS₂) as a result of existing MRLs (determined by the Commission Decision 2005/396/EC).
- Furthermore, naturally occurring compounds that mimic the presence of residues of dithiocarbamates are naturally occurring in plants. Therefore, when reviewing the MRLs for the common substances based on CS₂, EFSA was requested to consider also monitoring data from organic samples collected and made available by the EURLs, reflecting the sulfur naturally occurring in crops and not related to the uses of the dithiocarbamates.

EFSA Reports / amending Annex II to Regulation (EC) No 396/2005

Naturally occurring compounds in certain plant products mimic the presence of residues resulting from the use of those substances as pesticides. Therefore, **the Authority, in its reasoned opinion also considered monitoring data from organic products, reflecting content of CS₂ which is not related to the use of dithiocarbamates as pesticides.**

Published: 2022

ABSTRACT

Vine leaves, which are produced fresh, brined or fermented from the leaves of *Vitis Vinifera* in Türkiye are an important food. Sulfur is used as a pesticide and sulfur compounds can be used as additives during the growing and processing of the vine leaves. These sulfur sources cause positive results on carbon disulfide (CS₂) measurements by GC-MS. Therefore, the main objective of the present study was to investigate the effects of residues of sulfur or sulfur compounds on dithiocarbamate analysis methods based on CS₂ measurement. For this, vine leaves were produced by controlled agricultural production and processed as brine under controlled conditions. The sulfur dioxide (SO₂) and dithiocarbamate analysis were carried out on the vine leaf obtained by applying sulfur spraying in agricultural treatments and brined vine leaves produced by adding sodium metabisulfite (SM), and control samples of each stage. SO₂ was not detected in any of the samples in this study. SO₂ residues did not occur in the vine leaves as a result of the sulfur spraying application and therefore did not have a false positive effect on dithiocarbamate analysis. However, approximately 0.15 mg kg⁻¹ false positive dithiocarbamate was detected, which is thought to originate from natural sulfur in the vine leaves. The effect of SM, which was used in low concentration in the production of brined vine leaves, on dithiocarbamate results was limited. Even if SM was not used, the total false positive dithiocarbamate result in the brined vine leaves production process was approximately determined as 0.20 mg kg⁻¹. This study showed that the dithiocarbamates analysis method based on CS₂ measurement may lead to false positive results in brined vine leaves since sulfur compounds are found naturally in vine leaves.

FALSE POSITIVE RESULTS /2

Dithiocarbamates: A Complex Regulatory and Analytical Challenge

- **Regulatory status in the EU:** Metiram and ziram remain approved in the EU, while maneb, mancozeb, propineb and thiram are no longer approved.
- **Common analytical limitation:** All dithiocarbamates are measured as **carbon disulfide (CS₂)** because current analytical methods cannot distinguish which individual substance was actually used.
- **Naturally occurring CS₂ complicates enforcement:** ***Certain crops naturally contain sulfur compounds that generate CS₂, meaning detected residues may not necessarily originate from pesticide use.***
- **Risk management response:** To address both analytical uncertainty and incomplete substance coverage, the EU simplified the residue definition to: **“Dithiocarbamates determined and expressed as CS₂”**.

FALSE POSITIVE RESULTS /3


- The European Food Safety Authority (EFSA 2023) has reviewed the MRLs for dithiocarbamates. ***For products where Codex MRLs (CXLs)* or import tolerances exist and are considered safe, the European Commission proposes to adjust the MRLs accordingly. CS2 can occur naturally in some plants.*** In some cases, EFSA used monitoring data from organic products to identify the natural CS2 content in certain plants, which is unrelated to (and should not be confused with) the use of pesticides.
- **The Commission proposes to set the MRLs at the specific LODs for products where the use of plant protection products containing the active substances for dithiocarbamates is not authorised, if no import tolerances or CXLs exist.**

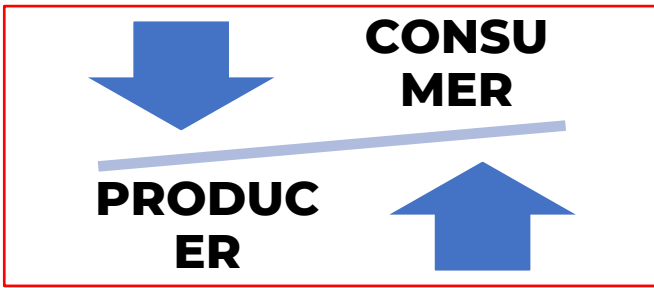
*: Codex MRLs are incorporated into EU legislation only after EFSA confirms that they are safe for EU consumers and when no EU reservation has been raised during Codex negotiations.

IMPORTANCE OF TRANSITION PERIOD

ACETAMIPRID


Approved

 WORLD TRADE ORGANIZATION
G/SPS/N/EU/787
12 July 2024
24-5124) Page: 1/2
Committee on Sanitary and Phytosanitary Measures Original: English



6. Description of content: The proposed draft Regulation concerns the review of existing MRLs for acetamiprid in certain food commodities. MRLs for these substances in certain commodities are lowered.

Article 2
This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.
It shall apply from ... [*Office of publications: please insert date 3 months after the date of entry into force of this Regulation*].

 Official Journal of the European Union

EN
L series

2025/158 30.1.2025

COMMISSION REGULATION (EU) 2025/158
of 29 January 2025
amending Annex II to Regulation (EC) No 396/2005 of the European Parliament and of the Council as regards maximum residue levels for acetamiprid in or on certain products

Article 2
This Regulation shall enter into force on the twentieth day following that of its publication in the *Official Journal of the European Union*.
It shall apply from 19 August 2025.

This Regulation shall be binding in its entirety and directly applicable in all Member States.
Done at Brussels, 29 January 2025.

≥ 1.5 YEAR



IMPROVE AWARENESS OF STAKEHOLDERS /1

INDOXACARP

Not approved

Communication/ Collaboration/ Coordination

**SPS National Sub-
Committee for Pesticide**



Committee' members:

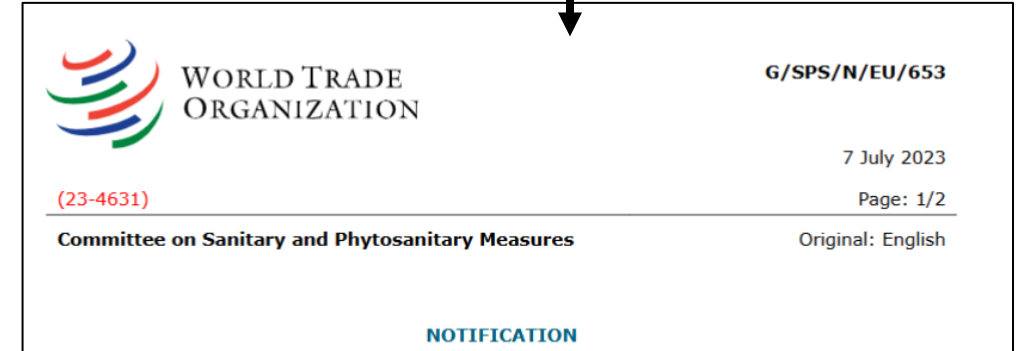
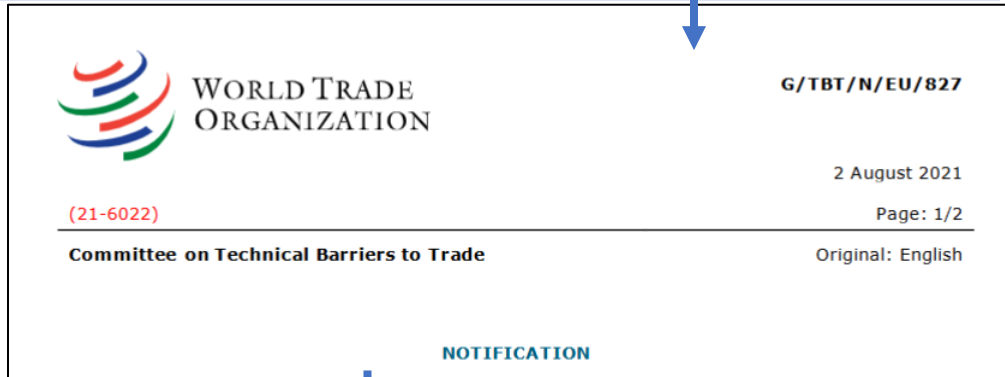
- **inspectors from provincial directorates**
- **experts from official control laboratories**
- **experts from other related Ministries (trade, custom etc.)**
- **researchers from institutes**
- **scientists from universities**
- **representatives from pesticide manufacturer, importers' association**
- **representatives from agricultural pest control association**

IMPROVE AWARENESS OF STAKEHOLDERS /2

TBT Notification REGULATION (EC) No 1107/2009

2021 → 2023

SPS Notification REGULATION (EC) No 396/2005



The approval of the active substance **indoxacarb** expired on **19 December 2021** and was non-renewed. All authorisations for plant protection products containing that active substance have been revoked.

6. **Description of content:** The proposed draft Regulation concerns the review of existing MRLs for indoxacarb in certain food commodities following the non-approval of indoxacarb in the European Union. Lower MRLs are set after deleting old uses which are not authorised any more in the European Union. MRLs in certain commodities for which a human health concern may not be excluded are also lowered.

INTERNATIONAL APPROACH

CODEX ALIMENTARIUS COMMISSION

Communication/ Collaboration/ Coordination

Codex Alimentarius Commission (FAO & WHO; 1963)



The Codex Alimentarius Commission, jointly established by the Food and Agricultural Organization (FAO) and the World Health Organization (WHO), is the most important international body in the field of food standards. Since 1963 -for over 60 years-, Codex has developed hundreds of internationally recognized

- **standards**
- **guidelines**
- **related texts**

**The CODEX is a big family
under a very colorful umbrella**

Plays a crucial role in

- protecting **health of the consumers**
- ensuring **fair trade practices** in the food trade,
- promoting **coordination** of all codex standards work undertaken by international governmental and non-governmental organizations.

Strenght of Codex Alimentarius Commission

Member Countries # 188

Member Organization (EU) # 1

Observers # 240

- Codex ensures transparency, inclusiveness and **CONSENSUS-DRIVEN** of the decision-making process
- The foundation of Codex standards is sound **SCIENTIFIC** evidence.
- Reference under WTO food safety disputes*



*: WTO Agreement on SPS, Artical 1 & Annex A <https://www.wto.org/>

CODEX ALIMENTARIUS COMMISSION

Codex Committee on Pesticide Residues

- **Establish priority list of pesticides for evaluation by JMPR**
- **Establish maximum residue limits (MRLs) for pesticides in food and feed moving in international trade**
- **Establish Extraneous MRLs (EMRLs) for environmental and industrial contaminants in food and feed (associated with the former use of pesticides in agriculture)**
- **Consider methods of analysis and sampling for the determination of pesticide residues**
- **Consider any matter related to the safety of food and feed containing pesticide residues**

**Reference: Gracia Brisco Secretary, Codex Committee on Pesticide Residues,
WTO/SPS Committee Thematic Session March 2022**

Priority List of Pesticides for Evaluation By JMPR

- **New Evaluations** new compounds and accompanying MRLs
 - *Principles and procedures for reviews of new compounds in parallel with national registration agencies and JMPR*
- **Additional Evaluations** more MRLs for existing compounds
- **Other Evaluations** Anything not considered about e.g. completion of the safety assessment with a view to providing MRLs, responses from JMPR to CCPR concern forms confirming or revising the MRLs etc.
- **Periodic Reviews** For compounds that have not been fully assessed for more than 15 years, in no case, for more than 25 years full dossier (toxicology to review/revise the health reference values + residue field trials to confirm/revise the existing MRLs)
 - *Database of national registration of pesticides to support periodic reviews of compounds by CCPR/JMPR*
 - *Management of unsupported compounds without public health concern scheduled for periodic review*

EU & CODEX DIFFERENT PHILOSOPHIES

There are clear trade implications. Under the WTO SPS Agreement, countries are encouraged to use Codex standards, but they are allowed to adopt stricter measures if scientifically justified.

In practice, this means exporters often need to comply with multiple standards simultaneously, increasing complexity and cost.

European Union (EU)

Precautionary

EU members consumption patterns

Risk assessment (EFSA)

Lower thresholds

Faster regulatory action

Codex Alimentarius (FAO/WHO)

Consensus-based

Global consumption patterns

Risk assessment (JMPR, JECFA)

Trade-oriented

Slower updates

LATIN AMERICA & GLOBAL TRADE PRESSURES

Category	Affected Products	Typical Contaminant / Issue	Main EU Concern
Pesticide Residues	Coffee, tea, fruits and vegetables, grapes, avocado	EU-banned or non-approved active substances	Exceeding EU Maximum Residue Limits (MRLs)
Mycotoxins / Aflatoxins	Corn, rice, cocoa, peanuts	Mold toxins (aflatoxins, ochratoxins)	Food safety and carcinogenic risk
Antibiotic Residues	Shrimp, seafood, meat	Nitrofurans, chloramphenicol, veterinary drug residues	Non-compliance with EU veterinary standards
Heavy Metals	Fish and seafood	Cadmium, mercury, lead	Toxicity and consumer health risk
Salmonella / Microbial Contamination	Spices, nuts, processed foods	Salmonella, <i>E. coli</i> , microbial contamination	Food safety and hygiene compliance

<https://webgate.ec.europa.eu/rasff-window/screen/search>

Active Participation in Codex Work

Codex is only as strong as its members.

- Visit the official [Codex homepage](#)
- Contact with the Country [Codex Contact Point \(CCP\)](#)
- Check the meetings [calendar](#)
- Follow the Codex Alimentarius Commission and Committee meetings in person or via online / webcast



Ministry of Agriculture & Forestry
Directorate General for Food & Control

THANK YOU FOR YOUR ATTENTION

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