Data Article

Data on heavy metal levels (Cd, Co, and Cu) in wheat grains cultured in Dashtestan County, Iran

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A R T I C L E   I N F O

Article history:
Received 19 June 2017
Received in revised form 19 July 2017
Accepted 3 August 2017
Available online 9 August 2017

Keywords:
Heavy metal
Wheat grains
Dashtestan county
Food sanitary

A B S T R A C T

Due to importance of wheat as the most popular food, in this data article, we determined the accumulation of heavy metal levels including Cd, Co, and Cu in wheat grains in Dashtestan county, Iran. The concentration levels of heavy metals in wheat grains cultured were determined by Flame Atomic Absorption Spectrometry (FAAS).1

1 Flame Atomic Absorption Spectrometry

http://dx.doi.org/10.1016/j.dib.2017.08.012
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Specifications Table

| Subject area               | Chemistry                        |
|----------------------------|----------------------------------|
| More specific subject area | Food sanitary                    |
| Type of data               | Table                            |
| How data was acquired      | Flame Atomic Absorption Spectrometry (Varian AA240 model, Australia) |
| Data format                | Raw, analyzed                    |
| Experimental factors       | Wheat grain samples were washed with tap water to remove any attached particles, rinsed three times with distilled water, and then dried at 38 °C till constant weight. Dried samples were ground by using a stainless steel grinder (< 0.25 mm) for heavy metal analysis. A portion of the dry wheat grains powder were digested in a mixture of HNO₃–HClO₄–H₂SO₄ acids. |
| Experimental features      | Evaluate the metal contents of Cd, Co, and Cu in wheat grains in Dashtestan county, Iran |
| Data source location       | Bushehr, Dashtestan county, Iran |
| Data accessibility         | Data is with this article.       |

Value of the data

- Data can be used as a base-line data for metal concentration levels in wheat grains.
- Data shown here can be useful for policy makers, managers, and all related stakeholders, companies, agencies, and institutes working in the fields of food sanitary by imposing proper measures to protect soil from pollutants.
- Data shown here may serve as benchmarks for other groups working or studying in the field of toxicology, soils amended with domestic sewage or irrigated with industrial effluents.

1. Data

The data in Table 1 show that Cd, and Co level were below limit of detection (BLD) in all wheat samples, but the mean concentration levels of Cu was 0.501 with a range of 0.223–0.849 µg/g, and the content level of moisture in wheat samples ranged from 10.15–14.88 (Mean: 11.51%). The measured detection limit values for Cd, Co and Cu were 0.0047, 0.015 and 0.0055 µg/g respectively. Each sample were measured three times and average were reported.

2. Experimental design, materials and methods

2.1. Study area description

Dashtestan County is the biggest county in Bushehr Province, in south west of Iran. This county has the first rank in production of date palm and cereals in Bushehr Province. The capital of the county is Borazjan. In this study, three important regions in wheat production including Shabankareh, Sadabad, and Tang Eram were selected as sampling points (Fig. 1).
Table 1
The content levels of heavy metals (µg/g) and moisture (%) in wheat grain samples.

| Region       | Number of samples | Samples | Moisture (%) | Cd (µg/g) | Co (µg/g) | Cu (µg/g) |
|--------------|-------------------|---------|--------------|-----------|-----------|-----------|
| Tang Eram    | 4                 | 1       | 10.15        | BLD       | BLD       | 0.65      |
|              |                   | 2       | 11.31        | BLD       | BLD       | 0.509     |
|              |                   | 3       | 11.25        | BLD       | BLD       | 0.223     |
|              |                   | 4       | 14.88        | BLD       | BLD       | 0.405     |
| Sadabad      | 4                 | 1       | 11.81        | BLD       | BLD       | 0.633     |
|              |                   | 2       | 11.15        | BLD       | BLD       | 0.540     |
|              |                   | 3       | 11.07        | BLD       | BLD       | 0.499     |
|              |                   | 4       | 10.16        | BLD       | BLD       | 0.592     |
| Shaban Kareh | 4                 | 1       | 11.57        | BLD       | BLD       | 0.849     |
|              |                   | 2       | 11.97        | BLD       | BLD       | 0.435     |
|              |                   | 3       | 11.29        | BLD       | BLD       | 0.435     |
|              |                   | 4       | 11.45        | BLD       | BLD       | 0.245     |
| Mean         | 12                | –       | 11.51        | BLD       | BLD       | 0.501     |
| Maximum      | –                 | –       | 14.88        | BLD       | BLD       | 0.849     |
| Minimum      | –                 | –       | 10.15        | BLD       | BLD       | 0.223     |
| Detection limit | –             | –       | 0.0047       | 0.015     | 0.0055    |

*BLD: Below limit of detection*
2.2. Sample collection and preparation

Twelve samples were collected in three agricultural areas in Dashtestan county (each site 4 times) just before wheat harvest. Nitrogen fertilizers were used on these grounds. Wheat plants at grain maturity (just before harvest) were randomly chosen within a 5 m × 5 m square, were cut with scissors at a height above 10 cm from the soil surface. The wheat samples were air dried for 8 days, and then put into labeled bags and transported to the lab. In the laboratory, grain samples were washed with tap water for 60 min to remove any attached particles, and rinsed three times with distilled water, and oven dried at 38 °C till constant weight. Dried samples were ground using a stainless steel grinder (< 0.25 mm) for heavy metal analysis.

2.3. Reagents

All the employed oxidants and mineral acids including HNO₃, H₂SO₄, and HClO₄ were of suprapure quality (Merck, Darmstadt, Germany).

2.4. Digestion and analytical procedures

A 2 g dried samples were crushed in a mortar and ashed in a muffle furnace at 450 °C for 6 h [1]. If the ashes were not completely white, 2 mL of concentrated HNO₃ were added and the mixture was heated to boiling point on an electric plate heater until the formation of nitrous fumes had stopped [2]. Then, the ashes were returned to the muffle at 450 °C for a further 2 h. Finally, the white ashes were digested in a mixture of HNO₃–HClO₄–H₂SO₄ acids (10 ml 70% HClO₄, 32 ml 10% HNO₃, and 5 ml 90% H₂SO₄) according to standard analytical procedures [3,4]. A Flame Atomic Absorption Spectrometry (FAAS, Varian AA240, Australia) [5–8] was used to determine the content levels of Cd, Co, and Cu.

Acknowledgements

The authors are grateful to the Bushehr University of Medical Sciences (Grant no 20/71/1875) for their financial support and the laboratory staff of the Environmental Health Engineering Department for their cooperation. The funder had no role in study design, data collection and analysis, or preparation of the manuscript.

Transparency document. Supporting information

Transparency data associated with this article can be found in the online version at http://dx.doi.org/10.1016/j.dib.2017.08.012.

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