**Table 2: Levels of Heavy Metal Contamination in Various Vegetables in Southwest Nigeria (2014-2024)**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Vegetable type** | **As** | **Cd** | **Cr** | **Co** | **Mn** | **Pb** | **Al** | **Zn** | **Hg** | **Ni** | **Fe** | **Cu** | **WHO limit** | **References** |
| 1 | *Talinum triangulare* | - | 3.52 | 49.13 | - | - | 9.97 | - | 17.82 | - | - | - | - | Exceeded limit. | Atikpo *et al.,* 2021. |
| *Ocimum gratissimum* | - | 3.64 | 3.87 | - | - | 3.95 | - | 4.45 | - | - | - | - |
| *Taraxacum officinale* | - | 6.12 | 4.89 | - | - | - | - | 5.27 | - | - | - | - |
| *Vernonia amygdalina* | - | 3.31 | 4.65 | - | - | - | - | 4.45 | - | - | - | - |
| *Cochorus olitorius* | - | ND | 4.87 | - | - | - | - | 4.91 | - | - | - | - |
| 2 | *Abelmoschus esculentus* | - | - | - | - | 0.72 | - | - | 0.64 | - | - | 1.59 | 0.09 | Yes | Okunlola, 2019 |
| *Amaranthus Hybridus* | - | - | - | - | 0.50 | - | - | 0.02 | - | - | 0.56 | 0.27 |
| *Basella alba* | - | - | - | - | 1.09 | - | - | 0.15 | - | - | 0.53 | 0.02 |
| *Corchorus olitorus* | - | - | - | - | 0.14 | - | - | 0.12 | - | - | 0.44 | 0.05 |
| *Telfaria occidentalis* | - | - | - | - | 0.11 | - | - | 0.01 | - | - | 0.99 | 0.003 |
| 3 | *Tomato* |  | 0.015 | 0.021 | 0.016 |  | 0.003 |  | 0.033 | - | - | 0.055 | - | Below limits | Farombi *et al.,* 2020 |
| *Bell pepper* |  | 0.013 | 0.018 | 0.015 |  | 0.005 |  | 0.030 | - | - | 0.053 | - |
| *Red pepper* |  | 0.016 | 0.024 | 0.016 |  | 0.007 |  | 0.031 | - | - | 0.069 | - |
| *Chilli pepper* |  | 0.013 | 0.034 | 0.015 |  | 0.006 |  | 0.043 | - | - | 0.066 | - |
| 4 | *Jatropha* *podagrica* | 0.035 | 0.317 | - | - | - | 0.210 | - | 0.220 | - | - | 0.210 | 0.013 | Cu and Zn were above limits | Ogunwale *et al.,* 2021 |
| *Talinum triangulare* | 0.030 | 0.143 | - | - | - | 0.001 |  | 0.257 | - | - | 0.169 | 0.004 |
| *Vernonia amygdalina* | 0.020 | 0.016 | - | - | - | 0.001 | - | 0.165 | - | - | 0.160 | 0.007 |
| *Ocimum gratissimum* | 0.016 | 0.018 | - | - | - | 0.001 | - | 0.075 | - | - | 0.183 | 0.008 |
| *Amaranthus viridus* | 0.063 | 0.238 | - | - | 0.011 | - | - | 0.375 | - | - | 0.131 | 0.007 |
| 5 | Green peas  (*Pisum sativum*) | - | - | ND | - | - | 1.68 | 14.0 | - | - | - | - | 0.13 | Pb, Ni and Al exceeded limits | Ojezele *et al.,* 2021 |
| Mushroom | - | - | 0.29 | - | - | 1.38 | 11.0 | - | - | - | - | 0.10 |
| 6 | *Telfairia occidentalis* | - | 0.18 | - | - | - | 0.08 | - | 2.5 | - | 0.45 | - | 3.21 | *Amaranthus hybdridus* and *Talinum triangulare* exceeded limit | Kolapo and Adeniyi, 2021 |
| *Corchorus olitorius* | - | 0.07 | - | - | - | 0.11 | - | 2. 84 | - | 0.58 | - | 4.29 |
| |  | | --- | | *Solanum lycopersicum* | | - | 0.18 | - | - | - | 1.00 | - | 3,6 | - | 0.34 | - | 4.20 |
| *Amaranthus hybdridus* | - | 0.17 | - | - | - | 1.40 | - | 2.48 | - | 0.71 | - | 2.41 |
| *Talinum triangulare* | - | 0.15 | - | - | - | 0.78 | - | 2.63 | - | 0.60 | - | 2.80 |
| 7 | *Celosia argentea* | - | - | - | 5.00 | - | 13.00 | - | 52.00 | - | - | - | 53..00 | Exceeded limit | Omoboyowa *et al.,* 2019 |
| *Cochorus olitorius* | - | - | - | 0.00 | - | 5.00 | - | 171.00 | - | - | - | 20.00 |
| *Talinum triangulae* | - | - | - | 0.00 | - | 3.00 | - | 37.00 | - | - | - | 44.00 |
| 8 | *Corchorus olitorius* | - | 0.03 | 0.07 | 0.33 | - | 0.04 | - | 1.70 | - |  | 3.10 | 0.35 | Yes | Oyebanji *et al.,* 2019 |
| *Telfairiaoccidentalis* | - | 0.04 | 0.04 | 0.35 | - | 0.08 | - | 1.32 | - | - | 2.86 | 0.28 |
| *Celosia argentea* | - | 0.07 | 0.12 | 0.50 | - | 0.03 | - | 1.29 | - | - | 2.58 | 0.26 |
| *Talinum triangulare* | - | 0.10 | 0.03 | 0.39 | - | 0.16 | - | 0.86 | - | - | 2.59 | 0.22 |
| *Vernonia amygdalina* | - | 0.11 | 0.04 | 0.37 | - | 0.14 | - | 0.24 | - | - | 3.27 | 0.25 |
| 9 | *Telfaria occidentalis* | - | - | - | 0.005 | 0.20 | 0.08 | - | 2.94 | - | - | - | 0.14 | Yes | Ofudje *et al.,* 2017 |
| *Celosia argentea* | - | - | - | 0.008 | 0.11 | 0.14 | - | 3.64 | - | - | - | 0.18 |
| 10 | *Telfairia occidentalis* | 0.04 | 0.42 | - | - | - | 2.75 | - | 2.94 | - | 0.17 | 10.34 | 4.88 | Yes | Ebabhi *et al.,* 2020 |
| *Corchorus olitorius* | 0.06 | 1.26 | - | - | - | 4.81 | - | 23.50 | - | 0.62 | 5.18 | 4.29 |
| *Celosia argentea* | 0.04 | 1.73 | - | - | - | 4.49 | - | 6.08 | - | 0.05 | 4.38 | 1.70 |
| 11 | *Amaranthus hybridus* | - | 0.035 | 0.005 | - | - | 0.095 | - | 0.034 | - | 0.009 | 18.319 | 0.009 | Yes | Adu *et al.,* 2014 |
| *Cochorus olitoris* | - | 0.023 | 0.004 | - | - | 0.015 | - | 0.066 | - | 0.005 | 12.145 | 0.005 |
| *Celosia argentea* | - | 0.013 | 0.052 | - | - | 0.008 | - | 0.083 | - | 0.007 | 6.214 | 0.009 |
| 12 | *Celosia argentea* | - | - | - | - | - | 0.768 | - | 22.321 | - | - | - | 0.367 | Pb and Cu exceeded limit | Babatuinde *et al.,* 2014 |
| *Amaranthus hybrides* | - | - | - | - | - | 0.614 | - | 18.250 | - | - | - | 0.125 |
| *Corchorus Olitorius* | - | - | - | - | - | 0.456 | - | 31.141 | - | - | - | 0.245 |
| 13 | *Amaranthus hybridus* | - | 0.51 | - | - | 0.98 | 0.05 | - | - | - | - | - | - | Pb and Cd exceed limit | Adewale *et al.,* 2022 |
| *Celosia argentea* | - | 0.002 | - | - | 0.54 | 0.006 | - | - | - | - | - | - |
| *Corchorus olitorus* | - | 0.01 | - | - | 0.43 | 0.01 | - | - | - | - | - | - |
| 14 | *A. viridis* | - | ND | 0.64 | - | 0.49 | - | - | 20.80 | - | 1.16 | - | 4.73 | Lower than permissible limit | Adedokun *et al.,* 2016 |
| *C. argentea* | - | ND | 1.10 | - | 1.08 | - | - | 15.39 | - | 4.15 | - | 3.96 |
| *O. gratissimum* | - | ND | 1.26 | - | 0.73 | - | - | 7.56 | - | 2.91 | - | 8.86 |
| *T. triangulare* | - | ND | 1.33 | - | 1.18 | - | - | 17.89 | - | 1.55 | - | 5.49 |
| *T. occidentalis* | - | ND | 1.51 | - | 1.84 | - | - | 5.73 | - | 2.61 | - | 6.84 |
| 15 | *Moringa oleifera* |  | 0.002 | - | - | - | 0.005 | - | - | - | - | - | 23.40 | Yes | Adejumo *et al.,* 2022 |
| 16 | *Lasianthera africana* | - | 0.02 | - | - | 21.8 | 0.25 | - | 1.34 | - | 1.46 | 3.13 | - | Yes | Oluwole *et al.,* 2021 |
| *Heinsia crinata* | - | 0.01 | - | - | 2.44 | 0.10 | - | 0.54 | - | 1.26 | 2.17 | - |
| *Gongronema latifolium* | - | 0.02 | - | - | 20.11 | 0.30 | - | 1.24 | - | 1.22 | 3.92 | - |
| *Piper guineense* | - | |  | | --- | | 0.010 | | - | - | 4.03 | 0.22 | - | 1.13 | - | 1.25 | 3.71 | - |
| 17 | *Amaranthus Spinosus* | - | 0.007 | - | - | 0.16 | 0.007 | - | 1.000 | - | - | - | 1.62 | Yes | Oluwole *et al.,* 2020 |
| *Talinum Triangulare* | - | 0.002 | - | - | 0.05 | 0.003 | - | 0.006 | - | - | - | 0.20 |
| 18 | *Amaranthus hybridus* | ND | 0.07 | ND | 0.042 | 1.67 | ND | - | 0.07 | ND | 0.19 | - | 0.01 | Pb exceeded limits | Ogunkule *et al.,* 2014 |
| *Brassica oleoracea* | ND | 0.06 | ND | 0.04 | 0.08 | 1.84 | - | 0.06 | ND | 0.13 | - | 0.070 |
| *Lactuca sativa* | ND | 0.08 | ND | 0.04 | 0.16 | 1.93 | - | 0.13 | ND | 0.29 | - | 0.002 |
| 19 | *M. oleifera* | - | 0.02 | 0.023 | - | - | 0.063 | - | - | - | 0.02 | - | 0.218 | Yes | Yahaya *et al.,* 2020 |
| *T. occidentalis* | - | ND | 0.019 | - | - | 0.032 | - | - | - | 0.008 | - | 0.414 |
| 20 | *Celosia argentea* | - | - | 3.90 | - | - | - | - | 7.30 | - | 2.01 | - | 16.52 | Exceeded limits | Agboola *et al.,* 2023 |
| *Vernonia amygdalina* | - | - | 3.26 | - | - | - | - | 6.26 | - | 0.61 | - | 18.98 |
| *Talinum triangulare* | - | - | 2.35 | - | - | - | - | 3.20 | - | 1.49 | - | 9.57 |

ND represents ‘Not detected’