**Supplementary Material**

**Table S1.** Demographic data collected from the sampled stores (five supermarkets and five butcheries)



**Date of sample collection: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Sample collection done by: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Sample unique identifier: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Store unique identifier: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

1. **Total number of cash registers in-store (a surrogate measure of store volume)**

1 to 5 □󠇯 6 to 10 □󠇯 11 to 15 □󠇯 16 to 20 □󠇯 21 to 25 □󠇯 ≥26 □󠇯

**2. “Sell-by” and packaging date of meat**

“Sell-by” date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Packaging date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**3. “May contain previously frozen meat” label**

Yes □󠇯 No □󠇯

**4. Final processing in store**

Yes □󠇯 No □󠇯 Unknown □󠇯

**5. Organic meat**

Yes □󠇯 No □󠇯 Unknown□󠇯

**6. Free range meat**

Yes □󠇯 No □󠇯 Unknown □󠇯

**7. Antimicrobial free meat**

Yes □󠇯 No □󠇯 Unknown □󠇯

**8. Price per kilogram:** R \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Table S2.** Captured demographic data collected from the sampled stores five supermarkets and five butcheries)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Collection date** | **Sample ID** | **Store ID** | **Number of cash registers** | **Sell-by date** | **Packaging date** | **Frozen meat label** | **Final processing in store** | **Organic meat** | **Free range meat** | **Antibiotic free meat** | **Price per kilogram** | **Other** | ***ESCCO* count** | ***SAL* spp. count** | ***ENT spp.* count** | ***CAM* spp. count** |
| 4-Jan-22 | PC1 | S1 | >= 26 | 9-Jan-22 | 31-Dec-21 | No | Yes | No | No | Unknown | ZAR 109,99 / USD 6,72 | Pork 360 quality sticker | <10 | Absent | <1 | <10 |
| 4-Jan-22 | PC2 | S2 | 6-10 | 4-Jan-22 | Unknown | No | Unknown | No | No | Unknown | ZAR 119,99 / USD 7,33 | Kinder to sows sticker | <10 | Absent | <1 | <10 |
| 4-Jan-22 | PC3 | S3 | 6-10 | 7-Jan-22 | Unknown | No | Unknown | No | No | Unknown | ZAR 99,99 / USD 6,05 | Sow friendly sticker | <10 | Absent | 16 | <10 |
| 4-Jan-22 | PC4 | S4 | 6-10 | 5-Jan-22 | 2-Jan-22 | No | Yes | No | No | Unknown | ZAR 89,99 / USD 5,50 | N/A | <10 | Absent | 1 | <10 |
| 4-Jan-22 | PC5 | S5 | 11-15 | 8-Jan-22 | Unknown | No | Yes | No | No | Unknown | ZAR 85,99 / USD 5,25 | N/A | <10 | Absent | <1 | <10 |
| 4-Jan-22 | PC6 | B1 | 1-5 | 6-Jan-22 | 2-Jan-22 | No | Yes | No | No | Unknown | ZAR 79,99 / USD 4,89 | N/A | <10 | Absent | <1 | <10 |
| 4-Jan-22 | PC7 | B2 | 6-10 | 7-Jan-22 | 2-Jan-22 | No | Yes | No | No | Unknown | ZAR 89,99 / USD 5,50 | N/A | <10 | Absent | <1 | <10 |
| 4-Jan-22 | PC8 | B3 | 1-5 | Unknown | 3-Jan-22 | No | Yes | No | No | Unknown | ZAR 90,00 / USD 5,50 | N/A | <10 | Absent | <1 | <10 |
| 4-Jan-22 | PC9 | B4 | 1-5 | Unknown | 4-Jan-22 | No | Yes | No | No | Unknown | ZAR 89,90 / USD 5,50 | N/A | 20 | Absent | <1 | <10 |
| 4-Jan-22 | PC10 | B5 | 1-5 | 10-Jan-22 | 3-Jan-22 | No | Yes | No | No | Unknown | ZAR 96,90 / USD 5,92 | N/A | <10 | Absent | 3 | <10 |

PC = Pork chop; S = Supermarket; B = Butchery; ESCCO = *Escherichia coli*; SAL = *Salmonella;* ENT = *Enterococcus*; CAM = *Campylobacter*; ZAR = South African Rand; USD = United States dollar. The average exchange rate for 2022 was used to convert the cost of meat per kilogram from ZAR to USD (i.e. 16.37 ZAR = 1 USD).

**Table S3.** Summary of antimicrobial resistance categories by number of open reading frame genes from 10 raw retail meat samples.

|  |  |  |  |
| --- | --- | --- | --- |
| **AMR categories** | **Supermarkets** **(n = Annotated ORFs)** | **Butcheries** **(n = Annotated ORFs)** | **Overall****(n = Annotated ORFs)** |
| Aminoglycoside | 4 | 2 | 6 |
| Bacitracin | 1 | 1 | 2 |
| Beta-lactam | **14** | 1 | 15 |
| Fluoroquinolone | 1 | 1 | 2 |
| Fosfomycin | 0 | 1 | 1 |
| Glycopeptide | 5 | 1 | 6 |
| MLS | 8 | 2 | 10 |
| Multidrug | **18** | **3** | 21 |
| Mupirocin | 0 | 1 | 1 |
| Peptide | 2 | 1 | 3 |
| Phenicol  | 3 | 0 | 3 |
| Sulphonamide | 1 | 0 | 1 |
| Tetracycline | **10** | **8** | 18 |

AMR = Antimicrobial resistance; ORF = Open reading frame; MLS = Macrolides, lincosamides and streptogramins.

**Table S4.** Summary of antimicrobial resistance mechanisms by number of ORF genes from 10 raw retail meat samples.

|  |  |  |  |
| --- | --- | --- | --- |
| **AMR resistance mechanisms** | **Supermarkets (n = Annotated ORFs)** | **Butcheries** **(n = Annotated ORFs)** | **Overall****(n = Annotated ORFs)** |
| Antibiotic efflux | 30 | 13 | 43 |
| Antibiotic inactivation | 19 | 3 | 22  |
| Antibiotic target alteration | 14 | 6 | 20 |
| Antibiotic target protection | 1 | 0 | 1 |
| Antibiotic target replacement | 3 | 0 | 3 |
| Reduced permeability to antibiotic | 2 | 0 | 2 |
| Resistance absence | 1 | 0 | 1 |

AMR = Antimicrobial resistance; ORF = Open reading frame

**Table S5.** Summary of virulence factor category by number of ORF genes from 10 raw retail meat samples.

|  |  |  |  |
| --- | --- | --- | --- |
| VF category | Supermarkets (n = annotated ORFs) | Butcheries (n = annotated ORFs) | Overall(n = annotated ORFs) |
| Adherence | 39 | 13 | 42 |
| Antimicrobial activity/Competitive advantage | 3 | 2 | 5 |
| Biofilm | 6 | 1 | 7 |
| Effector delivery system | 16 | 3 | 19 |
| Exoenzyme | 1 | 0 | 1 |
| Exotoxin | 2 | 0 | 2 |
| Immune modulation | 10 | 2 | 10 |
| Invasion | 7 | 0 | 7 |
| Motility | 11 | 2 | 13 |
| Nutritional/Metabolic factor | 11 | 4 | 15 |
| Post-translational modification | 2 | 0 | 2 |
| Regulation | 4 | 1 | 5 |
| Stress survival | 4 | 0 | 4 |

VF = Virulence factor

**Table S6.** Summary of toxin gene description by number of ORF genes from 10 raw retail meat samples.

|  |  |  |  |
| --- | --- | --- | --- |
| **Toxin gene description** | **Supermarkets** **(n = Annotated ORFs)** | **Butcheries** **(n = Annotated ORFs)** | **Overall****(n = Annotated ORFs)** |
| AcrB/AcrD/AcrF family | 5 | 4 | 9 |
| Capsule assembly protein Wzi | 1 | 0 | 1 |
| Dual specificity phosphatase, catalytic domain | 1 | 0 | 1 |
| Endonuclease/Exonuclease/phophatase family | 1 | 0 | 1 |
| Insulinase (Peptidase family M16) | 9 | 0 | 9 |
| Outer membrane protein | 9 | 1 | 10 |
| PapC N-terminal domain | 1 | 0 | 1 |
| Peptidase M16 inactivate domain | 1 | 0 | 1 |
| Presequence protease [EC:3.4.24.-] | 1 | 0 | 1 |
| Probable enterotoxin B | 1 | 0 | 1 |
| Probable enterotoxin D | 1 | 0 | 1 |
| Putative toxin 46 | 1 | 0 | 1 |
| S-type Pyocin | 1 | 0 | 1 |
| S1/P1 Nuclease | 1 | 0 | 1 |
| Putative hemolysin | 0 | 1 | 1 |



**Figure S1.** Mobile genetic element prediction of ARGs of all raw meat samples from both supermarket and butchery groups.Unclassified MGE predictions are genes with unknown mobile genetic element information.



**Figure S2.** Mobile genetic element prediction of VF and toxin genes of all raw meat samples from both supermarket and butchery groups.