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**Supplementary material for the methods section of the main paper**

This has two main sections: the data dictionary used for the SRMADCT project and some Glossary of terms related to database design.

# DCT Data dictionary

In this document entities and their corresponding variables are presented in tables

## Study form and study level variables

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Length | Caption |
| study\_id | Integer | 3 | **Read only**, imported from endnote with max length of 3 integers (###) |
| Study\_general\_Info | **Heading** |  | Non-fillable field |
| Year of Publication | Integer | 4 | **Read only,** imported from endnote with max length of 4 integers (####) |
| Country of cows | Integer | 1 | **Must-enter**  - The place where the study was conducted i.e. where the cows were staying not the origin of the authors  - The list of countries will keep growing and extending as long as more article would have been entered.  - Updated list with newly added countries will be distributed among the extractors |
| Author | String | 10 | **Read only**, Author last name imported from endnote …. without initials |

## Trial form and trial level variables

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Length | Caption |
| Identification | **Heading** |  | **non-fillable label** |
| study\_id | Integer | 3 | **Read only**, because it is the unique id of the study form, so it keeps showing up in the subsequent children forms |
| trial\_auto\_id | Auto | 3 | - **Read only**, automatically increasing variable starts from 1 and keep increasing by (1) for each entry and it can go all the way up till 999 max. (I gave it a length of 3)  - It acts as a unique id for the trial dataset (form) and will be used eventually when merging trial data with the subsequent children datasets |
| trial\_order | Integer | 1 | - **Must-enter**  - Order of the trail based on the sequence they were reported in the study, e.g. 1 for the first reported trial, 2 for the 2nd …etc  - To make the process of matching data extracted by different authors easier it would have been better for all authors to stick to the sequence as reported in the article. |
| Trial\_order\_expo | String | 7 | **Read only,** mirror variable reflects the trial order in the subsequent children forms |
| Study design | Integer | 1 | **Must enter** variable i.e. even if it wasn’t explicitly reported, we have to give a decision based on the methodology of the study  Drop down list (RCT/NRSI)… will be used later on to assign the trials (mostly would be studies bcz most of the studies has 1 trial) to either ROB2 or ROBINS risk of bias tools |
| Participants\_info | Heading |  | non-fillable label |
| No\_of farms selected for inclusion | Integer | 3 | - The totals before assignment to different treatments  - used to be reported in the first few lines of the M&M section |
| No\_of cows selected for inclusion | Integer | 4 | - The totals before assignment to different treatments  - It used to be reported in the first few lines of the M&M section |
| No\_of quarters selected for inclusion | Integer | 4 | - The totals before assignment to different treatments  - It used to be reported in the first few lines of the M&M section |
| Breed | Integer | 1 | **Must-enter**  1 Holsteins  2 Jerseys  3 Holst-Jerseys Mix  4 Others  5 Not-reported |
| Type of exposure | Integer | 1 | **Must-enter**  1 Natural IMI  2 Experimental Challenge  3 Natural- Experimental Mix |
| Challenge Bacterial Sp. | Integer | 1 | **Skip if Natural IMI**  1 Staph. aureus  2 Strept.  3 Staph-Strept mix  4 Ecoli  5 Others |
| Challenge dose | Float (##.##) | 6 | **Skip if Natural IMI** |
| Bacterial Conc.(CFU/ml) | Float  (##.##) | 7 | **Skip if Natural IMI** |

## Group form and group-level variables

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Length | Def / Caption |
| Identification\_info |  |  |  |
| study\_id | Integer | 3 |  |
| trial\_auto\_id | Integer | 3 |  |
| Trial\_expo | String | 10 |  |
| group\_auto\_id | Auto Increment | 6 | From 1 to 999999 |
| group\_expo | String | 7 | - **Read only**, mirror, automatically created variable exposing both the **order of the group** and **it’s corresponding active ingredient** e.g. 1\_Clox i.e. the 1st cloxacillin group  - It results from combining the entered results of **group\_order +** **active\_ingredient\_expo** |
| Group\_info |  |  | non-fillable label |
| group\_order | Integer | 1 | **Must-enter**  Order of the group based on the sequence they were reported in the study.., preferably to start with baseline group i.e. against which all other groups have been compared |
| Type | Integer | 1 | **Must-enter**  Nature of the group:  1 Control  2 AB\_single  3 AB\_combo (combination e.g. Pen-srept)  4 Ab\_TS (AB+teat\_sealnt) |
| active ingredient | Integer | 3 | **Must-enter**  1 -Ve cont  2 Placebo  3 Enro  4 Tylosin  5 Naficillin+pen+strept  Continuously updating list… |
| active\_ingredient\_expo | String | 7 | **Read only** variable, mirror exposing the selected active ingredient which used in combination with group\_order to create group\_expo |
| Concentration | Float  ##.## | 6 | **Skip if either -Ve cont or Placebo**  - May not be explicitly reported but can be easily found in the leaflet obtained from googling the active ingredient and company name |
| Concentration unit | Integer | 1 | **Skip if either -Ve cont or Placebo**  1 IU for Penicillins  2 mg/ml = g/L for soluble  - E.g. 5% Sodium Chloride Injections, i.e. 5 g/100ml = 5 g/dl = 50 g/L = 50 mg/ml |
| Concentration combo | String | 10 | **Skip if either -Ve cont or Placebo**  e.g. 100,500,80 comma-separated |
| Dose | Float  ##.## | 5 | **Skip if either -Ve cont or Placebo**  Quantity injected- |
| Dose unit | Integer | 1 | **Skip if either -Ve cont or Placebo**  ml/Kg  ml/Intra-mammary syringe |
| Route | Integer | 1 | **Skip if either -Ve cont or Placebo**  1 Intra-mammary  2 IM  3 SC  4 IV  5 Topical  6 Oral |
| Frequency of administration | Integer | 1 | **Skip if either -Ve cont or Placebo**  1 Single  2 Double  3 Triple |
| Interval between injections (days) | Integer | 2 | **Skip if either -Ve cont or Placebo**  e.g. 1, 2, 3, …, 14 days |
| Administration Regime | Integer | 1 | **Skip if either -Ve cont or Placebo**  1 Selective  2 Blanket |
| If selective what was the selection criteria | Integer | 1 | **Skip if either -Ve cont or Placebo**  **Skip if Blanket**  1 Petrifilm  2 SCC  3 Previous mastitis history |
| AB preparation | Integer | 1 | **Skip if either -Ve cont or Placebo**  1 Commercial  2 Experimental |
| If commercial |  |  | **non-fillable label** |
| Trade name | String | 10 | **Skip if either -Ve cont or Placebo**  **Skip if Experimental**  e.g. Baytril  e.g. Cepravin Dry Cow |
| Manufacturer Company | String | 10 | **Skip if either -Ve cont or Placebo**  **Skip if Experimental**  e.g. Bayer  e.g. MSD |
| AB leaflet URL if needed | String | 50 | **Skip if either -Ve cont or Placebo**  **Skip if Experimental** |
| TS ifno |  |  | non-fillable label |
| TS\_active ingredient | Integer | 1 | **Skip if either -Ve cont or Placebo**  1 bismuth subnitrate |
| Ts\_Conc (%) | Integer | 2 | **Skip if either -Ve cont or Placebo**  e.g. 65 |
| Ts trade\_ Name | String | 10 | **Skip if either -Ve cont or Placebo**  e.g. Teatseal |
| TS\_ Company | String | 10 | **Skip if either -Ve cont or Placebo**  e.g. Zoetis |
| Administration technique | **Heading** |  | non-fillable label |
| Intervention allocation unit | Integer | 1 | **Must-enter**  Cow/Quarter |
| Teat preparation before DCT infusion | Integer | 1 | **Must-enter**  1 Yes  2 No  3 Not-reported |
| Depth of insertion of DCT syringe cannula | Integer | 1 | **Must-enter**  1 **Full**… phrases indicate full insertions  e.g.  DCT was infused into the teat sinus, into  the teat cistern of each quarter  2 **Partial** e.g. teat canal = partial insertion  of the treatment syringe cannula only 3  mm  (1/8inch) into the teat canal  3 **Not-reported** |
| Teat spray or dipping after DCT infusion | Integer | 1 | **Must-enter**  1 Yes  2 No  3 Not-reported |
| Role in PICO | Heading |  | non-fillable label |
| PICO1-2 | Integer | 1 | **Must-enter**  1 Control  2 Treatment  3 Not-used |
| PICO3-4 | Integer | 1 | **Must-enter**  1 Control  2 Treatment  3 Not-used |
| PICO5 | Integer | 1 | **Must-enter**  1 Control  2 Treatment  3 Not-used |

## Outcome form and outcome -level variables

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Length | Question / Caption |
| Identification | **Heading** |  | **non-fillable label** |
| study\_id | Integer | 3 |  |
| trial\_auto\_id | Integer | 3 |  |
| Trial\_expo | String | 7 |  |
| group\_auto\_id | Auto | 6 |  |
| group\_expo | String | 8 |  |
| outcome\_auto\_id | Auto | 6 | **Read only,** 1 >> 999999 |
| outcome\_expo | String | 2 | **Read only,** Shows the label (C/I/P/CM) of the selected outcome and reflects it to the subsequent forms |
| Outcome\_info | **Heading** |  | **non-fillable label** |
| outcome | Integer | 1 | **Must-enter**  1 C (cure)  2 I (Incidence)  3 P (Prevalence)  4 CM (Clinical mastitis) |
| IMI\_defenition | String | 200 | **Must-enter**  Pls copy and paste line by line,  no multi-line entry |
| Detection Method | Integer | 1 | **Must-enter**  Culture  SCC  PCR |
| COV (cut-off value) if SCC (1000 cells/ml) | Integer | 3 | **Skip if Culture or PCR**  e.g. 200 or 150 |

**Time form and time -level variables**

In addition to time per se, only one variable (days post-calving) to describe when the results were reported

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Length | Question / Caption |
| Identification | **Heading** |  | **non-fillable label** |
| study\_id | Integer | 3 |  |
| trial\_auto\_id | Integer | 3 |  |
| Trial\_expo | String | 7 |  |
| group\_auto\_id | Integer | 6 |  |
| group\_expo | String | 8 |  |
| outcome\_auto\_id | Integer | 6 |  |
| outcome\_expo | String | 2 |  |
| time\_auto\_id | Auto | 6 | **Read only,** 1 >> 999999 |
| time\_expo | String | 2 | **Read only,** Shows the label (t1/t2) of the selected time point and reflects it to the subsequent forms |
| Time\_info | **Heading** |  | **non-fillable label** |
| time | Integer | 1 | **Must-enter**  Time  1 t1  2 t2 |
| days\_post\_calving | Integer | 3 | **Must-enter**  e.g. 7, 14 or 20 |

**Outcome-unit form and outcome-unit -level variables**

No new variables in this form except for the outcome assessment unit variable

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Length | Question / Caption |
| Identification | **Heading** |  | **non-fillable label** |
| study\_id | Integer | 3 |  |
| trial\_auto\_id | Integer | 3 |  |
| Trial\_expo | String | 7 |  |
| group\_auto\_id | Integer | 6 |  |
| group\_expo | String | 8 |  |
| outcome\_auto\_id | Integer | 6 |  |
| outcome\_expo | String | 4 |  |
| time\_auto\_id | Integer | 3 |  |
| time\_expo | String | 2 |  |
| unit\_auto\_id | Auto | 6 | **Read only,** |
| unit\_expo | String | 1 | **Read only,** Shows the label (C/Q) of the selected assessment unit and reflects it to the subsequent forms |
| unit | Integer | 1 | **Must-enter**  Unit  1 Cow  2 Quarter |

## Pathogen form and pathogen -level variables

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Length | Question / Caption |
| Identification | **Heading** |  | **non-fillable label** |
| study\_id | Integer | 3 |  |
| trial\_auto\_id | Integer | 3 |  |
| Trial\_expo | String | 7 |  |
| group\_auto\_id | Integer | 6 |  |
| group\_expo | String | 8 |  |
| outcome\_auto\_id | Integer | 6 |  |
| outcome\_expo | String | 4 |  |
| time\_auto\_id | Integer | 3 |  |
| time\_expo | String | 2 |  |
| unit\_auto\_id | Auto Increment | 6 |  |
| unit\_expo | String | 1 |  |
| pathogen\_auto\_id | Auto Increment | 6 | **Read only,** pathogen\_auto\_id |
| pathogen\_expo | String | 9 | **Read only,** pathogen\_expo |
| pathogen | Integer | 1 | **Must-enter**  Pathogen  1 tot\_non-Sp (total non-pathogen specific)  2 Staph. Aureus  3 Staph\_totals (all Staph Sp including S.aureus )  4 Strept (all Strept Sp)  5 Coliforms  6 Others\_mixed |

## Arm-based data form

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Length | Question / Caption |
| Identification | **Heading** |  | **non-fillable label** |
| study\_id | Integer | 3 |  |
| trial\_auto\_id | Integer | 3 |  |
| Trial\_expo | String | 7 |  |
| group\_auto\_id | Integer | 6 |  |
| group\_expo | String | 8 |  |
| outcome\_auto\_id | Integer | 6 |  |
| outcome\_expo | String | 2 |  |
| time\_auto\_id | Integer | 6 |  |
| time\_expo | String | 2 |  |
| unit\_auto\_id | Auto | 6 |  |
| unit\_expo | String | 1 |  |
| pathogen\_auto\_id | Auto | 6 |  |
| pathogen\_expo | String | 9 |  |
| Arm-based data | Heading |  | **non-fillable label** |
| # totals | Integer | 4 | **Must-enter** |
| # event +Ve (C/I/P/CM) | Integer | 4 | **Must-enter** |
| proportion | Float  #.## | 5 | **Must-enter**  If it wasn’t reported can be easily calculated by dividing the event +Ve over the total |

## Contrast-based data form

|  |  |  |  |
| --- | --- | --- | --- |
| Name | Type | Length | Question / Caption |
| Identification | **Heading** |  | **non-fillable label** |
| study\_id | Integer | 3 |  |
| trial\_auto\_id | Integer | 3 |  |
| Trial\_expo | String | 7 |  |
| group\_auto\_id | Integer | 6 |  |
| group\_expo | String | 8 |  |
| outcome\_auto\_id | Integer | 6 |  |
| outcome\_expo | String | 2 |  |
| time\_auto\_id | Integer | 6 |  |
| time\_expo | String | 2 |  |
| unit\_auto\_id | Auto | 6 |  |
| unit\_expo | String | 1 |  |
| pathogen\_auto\_id | Auto | 6 |  |
| pathogen\_expo | String | 9 |  |
| contrast\_auto\_id | Auto | 6 | **Read only,**  contrast\_auto\_id |
| contrast\_order | Integer | 1 | **Must-enter** depending on how many contrasts were reported for the same group when compared with others  1 contrast\_1  2 contrast\_2  3 contrast\_3  4 contrast\_4 |
| comparison\_group | Integer | 4 | **Must-enter**  1 -Ve cont  2 Placebo  3 Enro  4 Tylosin  5 Naficillin+pen+strept  Continuously updating list… |
| estimate\_type | Integer | 1 | **Must-enter**  1 OR  2 RR  3 IRR  4 HR |
| estimate\_scale | Integer | 1 | **Must-enterb**  1 linear  2 ln |
| estimate | Float | 8 | Estimate  For the baseline group we will either put 0 if linear or 1 if (log) |
| SE | Float | 8 | SE |
| CI\_level | Integer | 1 | 1 95%  2 99% |
| LCI | Float | 8 | LCI |
| UCI | Float | 8 | UCI |

# Glossary of terms

**This glossary was compiled mainly using material from the text books (Teorey et al., 2011; Watt & Eng., 2014) for Database Design Otherwise, specific sources are cited as part of the description of items.**

*Entities: principal data objects about which information is to be collected; they usually denote a person, place, thing, or event of informational interest*

*Attribute: a primitive data element that provides descriptive detail about an entity; a data field or data item in a record. For example, lastname would be an attribute for the entity Customer.*

*Entity instance: a particular occurrence of an entity*

*Database: a collection of interrelated stored data that serves the needs of multiple users; a collection of tables in the relational model.*

*A database management system (DBMS): a generalized software system for storing and manipulating databases. For example, Oracle, IBM’s DB2, and Microsoft SQL Server or Access.*

*Degree of a relationship: the number of entities associated in the relationship: recursive binary (1 entity), binary (2 entities), ternary(3 entities), n-ary (n entities)*

# References

Teorey, T., Lightstone, S., Nadeau, T., & Jagadish, H. V. (2011). 2 - The Entity–Relationship Model. In T. Teorey, S. Lightstone, T. Nadeau, & H. V. Jagadish (Eds.), *Database Modeling and Design (Fifth Edition)* (pp. 13-34). Boston: Morgan Kaufmann.

Watt, A., & Eng., N. (2014). *Database Design - 2nd Edition*. Victoria, B.C.: BCcampus. Retrieved from <https://opentextbc.ca/dbdesign01/>.