# Animal Disease Spread Model (ADSM) Text Support Document for Training

The slide-based training was designed to optimize visual interest. This format does not always create a slide bank that is printer friendly.  In some sections, there are many images and little text. This text support document is intended to be a printer-friendly version of the slides that can be used as a reference. This document is not intended to take the place of main training slides.

## Training 2 Population and Production Type

| Slide | Image | Text |
|---|---|---|
| 1 | Laying Hens | Animal Disease Spread Model Population and Production Types |
| 2 | ADSM Application Sample Scenario with Outputs | Table of Contents<br>What is a Population?<br>What is a Production Type?<br>Assembling a Population<br>Sample Scenario<br>What's Next |
|  |  |  |
| 3 | No Image | Document Conventions<br>The following conventions are used throughout the training modules:<br>**_TRAINING MODULES_** other than the one you are currently in will use all capital letters, bold face, italics and underline.<br>*Rhetorical questions* and *extra notes* will be in orange italics.<br>Conventions applying to the ADSM application are:<br>Navigation tabs on right and Admin panels on left are designated with an underline. Examples are Project Panel or Population tab.<br>Items with an action on click, such as [Apply] Button or [Save As] icon are enclosed in square brackets.<br>*Parameter fields* (inputs) are in blue italics and *Variables (*outputs) are in green italics.<br>Navigation Tabs > *Parameter field* indicates to go to the given navigation tab to find the given field.<br>Hyperlinks appear in bright green type with underline<br>http://navadmc.github.io/ADSM/ |
| 4 | Gear Section Break | What is a Population? (orange bar header) |
| 5 | Cattle grazing | The population is the collection of farm units that will be used in the model. A little later we will cover the details needed to make a complete population. |
| 6 | Gear Section Break | What is a Production Type? (brown bar header) |
| 7 | Cattle contact at fence/image of ADSM | A key concept in the population is the use of Production Types.<br>A production type describes both the species and the management practice of the farms to be included in the simulation.<br>The Sample Scenario includes very simple production types. |

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|  | production type panel |  |
| 8 | Assorted livestock images | The production types that go into the population depend on a number of factors, such as the disease that is being simulated. |
| 9 | Assorted livestock images | The production types will also depend on the area (location) that you want to represent and the animal management practices that are commonly used in that area. |
| 10 | Piglets nursing | A limitation in building a population may be the information you are able to find about the real farms in the area you want to represent. In the United States, the National Agricultural Statistics Service's Census of Agriculture provides an estimate of farm populations and farm types. USDA - National Agricultural Statistics Service - Census of Agriculture |
| 11 | Cattle up close | Many of the parameters in the model are assigned by production type.  For example, disease spread parameters for swine production types might be different for cattle production types, even though you are modeling the same disease.  Similarly, direct and indirect movements might be very different between production types for the same species (e.g. swine move from a nursery to a feeder operation, but not from a feeder operation to a nursery). The disease control parameters are also assigned by production type, giving the user flexibility in how control strategies are modeled (e.g. vaccinate large dairy and large and small swine nursery operations only). |
| 12 | Gear Section Break | Assembling a Population (yellow bar header) |
| 13 | Calves in barn | Assembling the Population<br>Depending on the source of your units, assembling the population file may be a quick process or a long and complicated one. The final file is expected to follow some rules for ADSM to recognize the parts of the file that are necessary for the simulation to complete. |
| 14 | Spreadsheet showing population file example | File Type<br>ADSM expects the file type to be a comma-separate value, or .csv file. It is possible to make a .csv file with Excel and other programs. The examples that are pictured will be in Excel as it is familiar to most users. |
| 15 | Table of definitions | Required and Optional fields in the Population File<br>Field Name, Data Type Description<br>The following fields are required:<br>UnitID, Text, User-defined Identifier of a unit. It is suggested that this identifier be unique.<br>ProductionType, Text,  User-defined name of Production Type<br>UnitSize, Integer, Number of animals in the unit, noted in application as Initial Size.<br>Lat, Real (floating point) number, Latitude of the unit, between -90 and 90 inclusive<br>Lon, Real (floating point) number, Longitude of the unit, between -180 and 180 inclusive<br>Status, Text, Disease state at the beginning of the simulation, see valid list on the following slide.<br>The following fields are optional if needed to adjust the disease state:<br>Daysinstate, Integer, Number of days the unit has been in the disease state, null or -1 indicate no days<br>Daysleftinstate, Integer, Number of days the unit has left in the disease state, null or -1 indicate no days |

*ADSM – Population and Production Types*

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| 16 | Table of valid disease states | Disease State Options for the Required Population File Field: Status<br>Disease State, Single Character Code<br>Susceptible, S<br>Latent, L<br>Subclinical B<br>Clinical C<br>Naturally Immune N<br>Vaccine Immune V<br>Destroyed D |
| 17 | Google Map Image | Some critical notes about the population file…<br>    Field Names must match exactly as shown, with no spaces<br>    Latitude and Longitude (Lat and Lon) must be valid within the    accepted world boundaries<br>    An error message will appear if the population file import fails to meet the expected guidelines<br>The online version of population requirements has a slightly more flexible interpretation. A single version is presented here to simplify the process. |
| 18 | Cow with ear tag noted as 120.0760.9749.9 | Unit ID is reflected in the Supplemental File outputs. It is not necessary to be unique for the application. Therefore, the application is not performing a verification of uniqueness. However, if you wish to perform herd-level follow-up analysis, a unique identifier could be helpful.<br>The thought behind the text identifier is that you may acquire your population from a source that uses a herd-level identifier that has a meaning and needs to be conserved and used for analysis (e.g., CH_120.0760). |
| 19 | Gear Section Break | Sample Scenario (green bar header) |
| 20 | Horses and pigs on pasture in Hawaii | We will address how to import a population file in the "Getting Started" training section as we start working with the application. The Sample Scenario will allow you to look at a synthetic population and how parameters have been created around the production types. |
| 21 | ADSM showing Sample Scenario | The Sample Scenario installed with ADSM |
| 22 | Gear Section Break | What's Next (blue bar header) |
| 23 | Flock of Sheep | Join the flock!<br>Learn more about ADSM or try an example<br>ADSM is currently available at<br>https://github.com/NAVADMC/ADSM/releases/latest<br>Try the sample scenario<br>https://github.com/NAVADMC/ADSM/wiki/A-Quick-Start-Guide:-Running-the-sample-scenario<br>Read the wiki pages link https://github.com/NAVADMC/ADSM/wiki |
| 24 | Goat on with green foliage | What's Next?<br>Addition training materials will be posted at<br>http://navadmc.github.io/ADSM/ |

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| | | Training will include:<br>    Overview<br>    Populations and Production Types<br>    Getting Started<br>    Disease Parameters<br>    Control Parameters<br>    Results<br>    Verification and Validation<br>    Vaccination Strategy<br>    Administration |
| 25 | Cattle image<br>Logo, University of Tennessee, Animal Science | This work was funded in whole through Cooperative Agreement AP18VSCEAH00C005 with the University of Tennessee Department of Animal Science by the Animal and Plant Health Inspection Service, an agency of the United States Department of Agriculture.<br>Photo credits<br>Canva.com<br>Mariposa Ranch Watusi<br>Ken Rager Photography<br>Ali Seamans, Dubois Holler Farms<br>Barton Farm<br>Roksolana Zasiadko unsplash<br>Pinecroft Farms, Woodstock CT, Mariah Chapman |
| | | Last Update: 1/2/2024<br>By: Schoenbaum<br>Approved: Freifeld |