PRODUCTION SCHEDULING

INTRODUCTION

1. Production Schedule for Facilities
   A. Primary purpose is to even out the production!
   B. By estimating the No. of sows/group, No. of boars and others for each farrowing group:
      1) Can maximize the utilization of facilities.
      2) Can prevent the production from “piling up” in a particular facility.

2. Advantages of Scheduling
   A. Can determine when to clean/disinfect various units for each group of sows/pigs.
      (Especially useful in the “all-in, all-out” system!)
   B. Can develop routine herd health programs.
   C. Can determine period(s) of high-labor requirements.
   D. Can select or purchase replacement gilts/boars at a proper time.
   E. Can manage boars properly (before, during and after breeding).
   F. Can manage sows/gilts properly (before & during breeding, and during gestation).
   G. Can develop marketing strategies and determine cash flow.
   H. Can help evaluating expansion opportunities and(or) facility requirements.
   I. May provide better cares for sows and pigs during farrowing and lactation phase.

3. Disadvantages
   A. No flexibility - have to follow the schedule, period! (Disadvantage?)
   B. Handling of sows not fitting the schedule - Probably the major disadvantage or problem!
      1) Not cycling at a proper time or recycling after breeding.
      2) May have to keep $\$ \$ \$ \$ a long time before fitting into the schedule, and it can be very costly! (Question - “Worth keeping those sows?”)
   C. To replace sows:
      1) A replacement gilts pool is required.
      2) Gilts have to be managed properly to fit into the schedule.

4. Terminology
   A. Farrowing interval:
      1) The sow’s biological cycle, i.e., days between two successive farrowings.
      2) The interval (I) includes breeding, gestation and farrowing periods:
         a) Breeding and farrowing times are somewhat flexible.
         b) Gestation is generally fixed (± 1-2 d).
   B. Breeding period:
1) Depends on which cycle to service & how long - Desirable to breed during the first cycle after weaning.
2) The return to “first estrus,” normally begins about 3 d after weaning (3-7 d).

C. Weaning age:
1) One variable that the producer can control within a practical limit.
2) Directly affects the rest of the schedule.

DETERMINATION OF INTERVAL BETWEEN SOW GROUPS

1. Equation

\[ I = G + RE + WA/NSG \]

where \( I \) = Interval between sow groups (day), \( G \) = Gestation length (day), \( RE \) = Minimum No. of days needed for the sow to return to estrus after weaning, \( WA \) = Weaning age (day), and \( NSG \) = No. of sow groups.

A. \( G \) (114 days) and \( RE \) (= 4 days) are considered constant.
B. Others can be changed or manipulated.

May be more practical to have “intervals” that are divisible by 7 (or week), but obviously it all depends on other factors!

2. Example - \( I \) = unknown, \( G \) = 114 days, \( RE \) = 4 days, \( WA \) = 35 days, and \( NSG \) = 3 groups.

A. \( I = 114 + 4 + 35 / 3 = 51 \) days interval

B. What happens to “\( I \)” if the producer wants to use 5 Gp of sows instead of 3 Gp?

1) Change the \( NSG \): \( I = 114 + 4 + 35 / 5 = 30.6 \) days

2) To get a whole number for \( I \), adjust \( WA \) (weaning age)! Want 30-day interval, thus:

\[ 114 + 4 + (x) / 5 = 30 \] days interval
\[ 118 + (x) = (30)(5) \]
\[ x = (30)(5) - 118 \]
\[ x = 32 \] (weaning age)

3. “\( I \)” and Weaning Age

A. “\( I \)” has a significant impact on weaning age!

B. e.g., Intervals of 27 and 28 days.

\[ 114 + 4 + (x) / 5 = 27 \] days \( x = 17 \) days (WA)
\[ 114 + 4 + (x) / 5 = 28 \] days \( x = 22 \) days (WA)

C. Thus, when weaning pigs at a very young age, the addition of one day to the interval may be very important!
FACILITY SCHEDULE FOR A "NEW OPERATION"

Assumptions for the example: 51-day interval, 3 groups of sows, 10-day breeding period, and sows into the farrowing unit 6 days before expected date.

1. Sow groups

- Should be listed in the group column (Gp) - A1, B1, C1, A2, etc.

2. Breeding Facility Schedule

A. Arbitrarily select day 1 - The day to start breeding Group A!

B. Then:

1) Group B1 should begin breeding on day 52 (1 + 51).
2) Group C1 on day 103 (52 + 51) . . . , etc.

C. If the breeding period is 10 days:

1) The last sow should be serviced by day 11 (1 + 10).
2) Group B1 on day 62 (11 + 51 or 52 + 10).
3) Group C1 on day 113 (62 + 51) . . . , etc.

D. Moving sows into the breeding unit:

1) Many sows are coming into estrus about 4 days after weaning. (Majority of sows - 3 to 7 days after weaning! Hopefully!)
2) “In” column for the breeding unit should be 4 days less than the “1st sow” column!

   a) For Group A1, assume moving sows & breeding the "1st sow" on the same day.
   b) Group B1 must be moved into the unit by day 48 (52 - 4).
   c) Group C1 by day 99 (48 + 51 or 103 - 4) . . . , etc.

E. Moving sows out of the breeding unit:

1) Group B1 must come into the breeding unit by day 48, . have to move Group A1 before that day!
2) In this example, move Group A1 sows on day 47. [But, better to empty the unit (other units too) ≥ a week before the next group so that it can be cleaned & disinfected though!]
3) Group B1 on day 98 (47 + 51).
4) Group C1 on day 149 (98 + 51) . . . , etc.
3. **Gestation Facility Schedule**

A. For Group A1, "Out" date for the breeding unit becomes "In" date for the gestation unit, i.e., **day 47**.

- Similarly, enter dates for other groups!

B. When to move out? Depends on the timing of moving sows into the farrowing unit!

4. **Farrowing Facility Schedule**

A. Moving sows into the farrowing unit:

1) Should be 4 to 6 days before day 114 of gestation or expected date. (Use 6 days in this example: 115 - 6 = **day 109** for Group A1!)

2) The date for moving out (gestation unit) = moving in (farrowing unit).

B. Moving sows out of the farrowing unit:

1) Group A2 (2nd time for Group A) - Start breeding on **day 154**, and it takes **4 days** for sows to return to estrus after weaning! Thus, have to wean Group A1 on or by **day 150**.

2) For other groups, just add 51 days - e.g., 150 + 51 = 201 for Group B1.

[Intended to wean pigs at 35 days of age, but actually end up with 25 (150 - 125 = 25) to 35 (150 - 115 = 35) days! Thus, again, important to consider weaning age when working on the schedule!]

5. **Nursery & Growing/Finishing Facilities**

- Nurseries are generally designed to hold pigs until 40 to 50 lb.
- A common practice to keep pigs in the nursery for 4 to 5 weeks.

- In this e.g., pigs in the nursery for 4 wk:

1) Pigs from Group A1 remain in the unit from weaning (day 150) until day 178 (150 + 28).

2) Pigs from Group B1 (to be moved in on day 201) are not forcing "Group A1-pigs" out, thus, can keep pigs in the nursery longer! (Some pigs are 63 days old, but some are only 53 days old!)

3) For other groups, just add 51 days.

4) "Out" (nursery) = "In" (grower-finisher unit).
6. After Completing a “Basic” Schedule:

A. May want to incorporate other aspects of swine production in the schedule to make it more complete - e.g., selection/stimulation of gilts, cleaning & disinfection of units, etc.

B. Then, convert the “Julian dates” to “calendar dates” using a conversion sheet!

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* In leap years, after February 28, add “1” to the tabulated number. As the figures go into the second year, they can be kept within the limits of the table by subtracting 365 or 366 (leap year): e.g., 395 is January 30 – 395 - 365 = 30. January 30; leap year prior: 396 is January 30 – 396 - 366 = 30. January 30. Leap year - Subtract “1” from the tabulated number when going from the Julian to calendar date.
FACILITY SCHEDULE FOR THE EXISTING HERD

1. **Expected Farrowing Dates** - See a box.

2. **Step 1**
   
   A. Look at available breeding or expected farrowing dates of the herd.
   
   B. Because the weaning date is the “Master Control Switch,” it is better to use the farrowing dates.

3. **Step 2**
   
   A. Locate a group of sows that are close together, and assign group number (e.g., A1).
   
   B. All sows in the group have to be weaned on the same day, thus may have to wean some sows very early and others very late!
   
   C. Group other sows in the herd by expected farrowing dates, letting sows cycle 1 x or 2 x, adding a new group of gilts, etc.

4. **Example**
   
   - The producer wants: 3 groups of sows, 10 sows per group, wean pigs at 35 days of age, and interval of 51 days.

   A. Organization of farrowing dates - See a box.

   B. Step-by-step:

   1) Farrowing unit - for the A1 group, use the date for Sow # 9 (≈ middle):

   a) Weaning at day 35 of lactation → 97 + 35 = 132 \( \equiv \) a weaning date.
   
   b) Wean all sows at day 132 (weaning age, 28 to 41 days).

   2) Breeding unit:

   a) For Group A1 - “In” on day 132 & “1st sow” on **day 136** (132 + 4).
   
   b) For Group B1 - “In” on **day 183** (132 + 51) & “1st sow” on **day 187** (136 + 51).
Weaning age is **15 to 24** days, ∴ have to provide a good environment (nursery, diets, etc.) for pigs!

c) For Group C1 - The 1st sow will to be bred on **day 238** (187 + 51):

(1) If wean sows on **day 234**, weaning age would be **52 to 66** days!

(2) Instead, wean sows on **day 213** (weaning age, 31 to 45 days), and let sows cycle once (238 - 4 - 21 = day 213 embryo weaning date).

C. Summary:

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<th>Gp</th>
<th>Farrowing unit</th>
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May experience considerable difficulties in the farrowing unit and nursery in the beginning!