

References

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2. *Anleitung zum Gebrauche des Rechenstabes von A.W.Faber* (Instructions for the use of A.W.Faber slide rules). A.W.Faber, 1901.
3. A.W.Faber Stein bei Nürnberg. *Anleitung zum Gebrauche des Rechenstabes*. A.W.Faber, 1906.
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5. Sauer, R.: Private communication.
6. von Jezierski, D.: Private communication.
7. See for example the Faber-Castell Anniversary Magazine, page 108, which is to be found at http://issuu.com/faber-castell/docs/e-mag_1002/1?mode=a_p
8. Anke von Heyl, “*Art Nouveau*”, H.F.Ullmann, 2009.
9. Flom, G.S., *The Keuffel & Esser Building in New York City*, Journal of the Oughtred Society, 14:2, Fall 2005, pp 54-56.

Danish Pig-Feeding Slide Rule

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Introduction and Description

The Danish Pig-Feeding Slide Rule is a special purpose rule, double-sided, with two slides, but no cursor, for calculating two things:

- a) Food distribution calculation for pigs.
- b) The farrowing and weaning dates of piglets.

The entire rule is sealed over both sides with clear plastic sheets which are riveted to the two stators; the two slides slide against each other within the two stators.

Source and Reason for Purchase

The rule was bought from Jon Kvint at IM2003 in The Netherlands for a number of reasons:

- a) The rule has an interesting construction, being double-sided with two slides.
- b) The labeling of the rule is in a language other than English.
- c) One thread of the author’s relatively recent ancestors were pig farmers in Limerick, Ireland, so there would be a “familial” association, even though those ancestors probably spoke *An Gaelige* (Irish Gaelic) rather than Danish.

Sample Food Distribution Calculations

A food distribution calculation calculates the amount of food, measured in liters, to be distributed to pigs, given the number of pigs in a pen, the number of pens in a sty, and the weight in kilograms per liter of the foodstuff. There are six scales on the front side dedicated for this purpose.

The amount of foodstuff to be given to each pig is defined in kilograms, and presumably varies according to the size and age of each pig, whether or not a pig is pregnant, and so on.

The six scales on the rule are distributed as follows:

- The top stator has one scale labeled ‘a’.
- The top slide has two scales labeled ‘b’ and ‘c’.
- The second slide has two scales labeled ‘d’ and ‘e’.
- The bottom stator has scale ‘f’.

A Typical Example

An example is now given: in this example, starting from the top, one assumes that there are eight pigs, of which each pig is to receive 0.8 kg of foodstuff; that is, 0.8 kg per pig (“svin”).



Figure 1. A Typical Calculation



Figure 2. A Second Example Calculation

The first conversion is to divide by the kg/liter value for the foodstuff in question, to get liters per pig. So, on the ‘a’ and ‘b’ scale, 0.8 is to be placed over 0.5, where 0.5 is the kg/liter value in this case.

Now one must multiply the resulting number of liters by the total number of pigs in the “sti” (sty), in this case, 8, on the ‘d’ scale, to get the total number of liters of foodstuff for all of the residents of the sty.

Note that there are two index points on the ‘c’ scale to be used against the ‘d’ scale; one is **black** and one is **red**. Also note that the ‘d’ scale is a reciprocal scale somewhat like the CI scale on more traditional rules; in consequence, an action that at first sight looks like a division is in fact a multiplication.

Finally, one must divide the total number of liters by the number of “Kasse(r)” (pig pen(s)) in the sty, as shown on the ‘e’ scale, to calculate the number of liters to throw into each pig pen, as shown on the ‘f’ scale. In this case, the 8 pigs are evenly divided into 4 pig pens resulting in 3.2 liters per pig pen.

To summarize, the overall calculation sequence is therefore:

$$(\text{Liters per pig}) = (\text{Kilograms per pig}) / (\text{Kilograms per liter of foodstuff})$$

$$(\text{Liters per sty}) = (\text{Liters per pig}) * (\text{number of pigs in the sty})$$

$$(\text{Liters per pig pen}) = (\text{Liters per sty}) / (\text{number of pig pens in the sty})$$

A Second Example

A second example is now given: in this example, starting from the beginning, one assumes that there are only two pigs, of which each pig is to receive 0.4 kg of foodstuff; that is, 0.4 kg per pig (“svin”).

The foodstuff’s weight per liter remains unchanged.

The first conversion is again to divide by the kg/liter value for the foodstuff in question, to get liters per pig. So, on the ‘a’ and ‘b’ scale, one must set 0.4 over 0.5, where 0.5 is again the kg/liter value.

Now one must multiply the resulting number of liters by the total number of pigs in the “sti” (sty), in this case only 2, on the ‘d’ scale, to get the total number of liters of foodstuff for all of the residents of the sty. Note that that the **black** index mark is out of range of the values on the ‘d’ scale, so the **red** index must be used this time.

Finally, one must divide the total number of liters by the number of “Kasse(r)” (pig pen(s)) in the sty, as shown on the ‘e’ scale, to calculate the number of liters to throw into each pig pen, as shown on the ‘f’ scale. In this case, the 2 pigs are evenly divided into 2 pig pens resulting in 0.8 liters per pig pen. Note that, above, the **red** index was used, so this time one must use the **red** series of numbers on the ‘f’ scale.



Figure 3. Farrowing Dates and Weaning

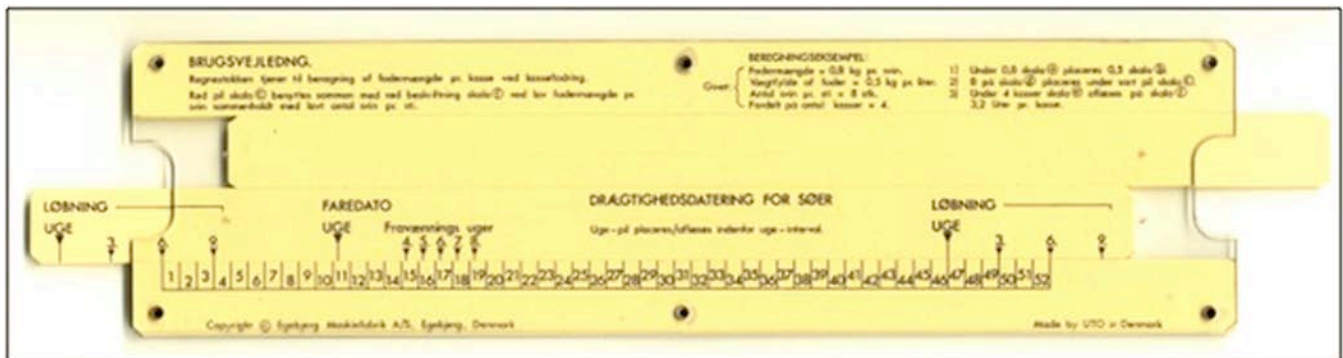


Figure 4. Farrowing Dates and Weaning

Scales for Dates

The farrowing (giving birth) dates of sows and age of the piglets at weaning – there are two scales on the reverse side which are dedicated to this purpose.

Wikipedia [1] explains that the gestation period for a pig is “3 months, 3 weeks, and 3 days”, which is an easy algorithm to remember; however, the Wikipedia article does not specify how long each month is. However, assuming 52 weeks and 12 months per year, one can estimate that “3 months” means 13 weeks, giving a total of 16.5 weeks with only small margin of error.

So, in the example shown “LØBNING” (mating) takes place at the beginning of “UGE”(week) 10, and the “FAREDATO” (farrowing date) is subsequently part way through week 26, which is consistent with the algorithm given in Wikipedia.

Five specific weeks are shown after the farrowing date, giving the age of the piglets when weaned at 4, 5, 6, 7, or 8 weeks. It is not known why these different ages might be

significant; however, the author imagines that these ages could be related to the pigs’ suitability for taking to market at various ages and weights.

Three specific weeks 3, 6, and 9 are shown after the mating date; what the significance of these post mating dates might be is not known; however, the author imagines that these dates might be related to modifying the food needs of the sow

For a mating near the end of a year, a second set of “LØBNING” (mating) dates are shown, allowing wrap-around into the beginning of the following year.

For example, in this case, mating takes place at the beginning of week 47, giving a farrowing date part way through week 11 of the following year.

References

1. http://en.wikipedia.org/wiki/Intensive_pig_farming#Sow_breeding_systems.



Image from Norden: Nordic Council of Ministers <http://www.nordicenergysolutions.org/inspirational/pig-city>