



Iowa Pork Industry Center

Estimating Pen Feed Allocations Based on Maintenance Metabolizable Energy Requirements¹

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In the event of supply chain disruptions in which feed trucks cannot access grow-finish sites for a variety of reasons (inclement weather, feed mill shutdowns, foreign animal disease outbreaks and quarantine restrictions, etc.), this tool can help producers extend on-hand feed supply by restrict feeding group housed pigs. This tool can be used as a *guide* to estimate daily pen feed allowance utilizing two input factors. It estimates pen feed allowances based on maintenance metabolizable energy (ME) requirements and considers the number of pigs in a pen, the estimated average pig body weight, and the ME level of the diet being fed. These calculations are based on the Nutrient Requirements of Swine (2012) maintenance ME (ME_m) equation² for growing-finishing pigs:

$$ME_m \text{ kcal/d} = 197(\text{body weight})^{0.6}$$

Inputs:

1. Enter *Diet Information*
 - Metabolizable energy (ME) level of diet (kcal/lbs)*
 - Estimated Current Feed Inventory, including feed bins and feeders (tons)
2. Enter *Pen Information*
 - Average pig body weight (lbs)
 - Number of pigs/pen
 - Current pig inventory
 - Desired Maintenance multiplier (1.0 – 3.2)[#]
 - Required Maintenance ME is the kcal ME per day a pig is estimated to need to achieve the “Desired Maintenance multiplier” input

Outputs:

1. *Ranging ME multiplier*[#]
 - Maintenance ME multiplier factors ranging from 1.00 to desired input.
 - Desired: Reports the Desired Maintenance multiplier from the *Inputs* box.
2. *Feed Allocation* reports the estimated amount of feed (lbs.) per *pig* and *pen* per day necessary to achieve the “Desired Maintenance multiplier” level chosen.
3. *On-hand Feed Supply* provides an estimated number of days of feed supply remaining at each feed allocation amount.
4. *Probable Gain* estimates pig body weight gain after 1 or 2 weeks on the desired feed allocation.

Notes:

¹This calculator is just a guide. Please consult your nutritionist and veterinarian for guidance prior to implementation. This assumes pigs are housed within their thermal neutral zone. When allocating feed to pigs below *ad libitum*, as always, be observant of any stress or well-being concerns. Ensure pigs have free access to water.

²NRC. 2012. Nutrient Requirements of Swine. 11th ed. Washington (DC): The National Academies Press.

*ME of diet: Will be something your nutritionist or consultant will have easy access to.

[#]Desired maintenance multiplier:

- a. 1X maintenance: pig ME requirement to maintain static body weight, i.e. not gain any weight.
- b. *Ad libitum* feed consumption is estimated to be approximately 3.2X maintenance when feeding a typical corn-soybean meal type diet that meets or exceeds nutrient requirements for optimal growth. This number may change with diet composition, barn conditions, and pig genotype.

Supporting material:

Kayla A. Miller, EM Johnson, SA Matchan, D Goehring, JW Ross, NK Gabler. Strategies to manage barn feed supply to prolong and hold late finishing pigs during a supply chain disruption, *Translational Animal Science*, Volume 7, Issue 1, 2023 txac166, <https://doi.org/10.1093/tas/txac166>

Kayla A. Miller. Management strategies to extend feed budgets of grow-finish pigs and the effect on performance, behavioral aggression, and gastric ulceration. Master's Thesis. Iowa State University Digital Repository. 2022. <https://dr.lib.iastate.edu/handle/20.500.12876/erLKeLov>

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