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Hongjie Dong* (Hongjie_Dong@brown.edu), Division of Applied Mathematics, 182 George Street, Providence, RI 02912. *Some remarks on the aggregation equations.*

We study the multidimensional aggregation equations with power-law kernels K . We prove that with biological relevant potential $K(x) = |x|$, the equation is ill-posed in the critical Lebesgue space $L_{d/(d-1)}(\mathbb{R}^d)$. We then extend this result to more general power-law kernels $K(x) = |x|^\alpha$, $0 < \alpha < 2$ for $p = p_s := d/(d + \alpha - 2)$, and prove a conjecture of Bertozzi, Laurent and Rosado about an instantaneous-mass-concentration phenomenon. Finally, we classify all the “first kind” radially symmetric similarity solutions in dimension greater than two. (Received August 12, 2010)