

# PinkPig Formulation

The statement of the use case is on Mip Wise's website: [mipwise.com/use-cases/freshly](https://mipwise.com/use-cases/freshly).

## Formulation

### Decision Variables

The decisions we have to make is the amount of each food that goes in the daily mix.

- $x_1$  - Kilograms of rice.
- $x_2$  - Kilograms of corn.

### Constraints

- Minimum recommended intake of carbohydrates:

$$0.77x_1 + 0.66x_2 \geq 6.0.$$

- Minimum recommended intake of protein:

$$0.08x_1 + 0.14x_2 \geq 0.9.$$

- Maximum recommended intake of carbohydrates:

$$0.77x_1 + 0.66x_2 \leq 7.5.$$

- Maximum recommended intake of protein:

$$0.08x_1 + 0.14x_2 \leq 1.6.$$

### Objective

The objective is to minimize the total cost of the diet.

$$\min 1.50x_1 + 2.23x_2.$$

### Final formulation

$$\begin{array}{ll} \min & 1.50x_1 + 1.23x_2 \\ \text{s.t.} & 0.77x_1 + 0.66x_2 \geq 6.0, \\ & 0.08x_1 + 0.14x_2 \geq 0.9, \\ & 0.77x_1 + 0.66x_2 \leq 7.5, \\ & 0.08x_1 + 0.14x_2 \leq 1.6, \\ & x_1, x_2 \geq 0. \end{array} \tag{1}$$