Comparing Barley with Palm Kernel Expeller Meal (PKE) and Tapioca

Barley, PKE and Tapioca are all very different feeds and decisions about "Which one for me?" depends on what your cows need. The differences between these feeds, typical second or third round spring pasture, and the 'ideal' feed for a cow are shown below.

	A cow* needs:	**Barley**	**PKE**	**Tapioca**	**Spring pasture**
	% of Dry Matter				
DM%	35-50	87	90	90	9 – 18
Crude Protein	18	12	16 – 18	2.5 – 3.5	18 – 35
Sugar	35-40	3	1 – 5	3.0 – 5.0	3 – 15
Starch		60	1 – 5	65 – 80	Less than 2
NDF (fibre)	35	16 – 20	50 – 65	8.0	28 – 45
Oil/Fat	5	2	8 – 10	0.5 – 1.0	3 – 8
MJME	High	12 – 13	11 – 12	14 – 14.5	11.5 – 12.5
Palatability	High	High	Moderate	Moderate	High

*These are approximate requirements of a cow in early lactation producing around 2.0 kgMS per cow per day

Feeding a cow well means balancing the diet to provide as close to the ideal cow requirements as you can.
Dry Matter (DM) %: Spring pasture is lush and contains low levels of dry matter. The best supplements are high DM% ones because every bite of supplement delivers more dry matter than sloppy spring pasture that contains lots of water.
Crude Protein: Levels are high in most spring pasture. High protein can cause cows to lose too much weight in early lactation due to the energetic requirements by cows to detoxify and excrete excess protein as urinary urea. High protein can reduce the fertility of dairy cows. The ideal spring supplement should contain low levels of protein to dilute down total dietary protein levels and to provide energy to rumen bugs to mop up spare protein for the cow to use. Barley and Tapioca are the best option for this time of year due to the much lower levels of protein in value compared with PKE.
Sugar: PKE, Barley and Tapioca all contain low levels of sugar. High sugar supplements include molasses, reject sugar and Proliq.
Starch: Barley contains lots of starch which is used by the cow to make milk and / or to gain condition heading into mating. Pasture contains very little / any starch. Starch levels are also low in PKE. Tapioca contains very high levels of starch and the starch in tapioca breaks down in the rumen more quickly than the starch in barley. Feeding higher rates of tapioca may increase risk of rumen acidosis in cattle because of this rapid rate of starch breakdown in the rumen compared with barley.
NDF: Low NDF feeds are good because they break down quickly in the rumen and pass into the intestines, leaving more room to fit in more feed = better appetite. Low levels of NDF in barley mean more energy for making milk or gaining cow condition. This is especially important when feeding high NDF feeds like winter save pasture and high NDF poor quality silages. Barley is very valuable when other parts of the diet contain high NDF. Tapioca contains extremely low levels of NDF which may increase risk of rumen acidosis when tapioca is fed together with very high quality pasture.
Oil/Fat: Fats give the cow's energy and help her keep condition on her back in early lactation and to gain more condition in late lactation. Barley and Tapioca contain little fat. PKE contains the most fat and can be useful for keeping condition on cows heading into peak lactation.

Barley provides cows with an excellent source of energy because starch is quickly broken down in the rumen to fuel the cow with higher levels of blood glucose. Barley is low NDF, meaning cows can eat more total dry matter every day.
Always compare barley with other feeds on a starch-equivalent and NDF basis, not just based on cents per kg of DM or cents per MJME.