6. GENERAL DISCUSSION

Temulawak (*Curcuma xanthorrhiza* Roxb) is one of herbal plants that has been widely used in Indonesia. This curcuma production nationally is about 27.10^3 tons per year. It contains bioactives of curcuminoids consisting of curcumin, desmethoxycurcumin, bisdemethoxycurcumin, and xanthorrhizol. These bioactives are potential as organic antibiotic, antimicrobes, antiinflammation, and hypocholeretic. One of local wisdoms is preparing a mixture of temulawak fluid and fermented cassava to be consumed by a woman after giving birth and lactation, so that the milk would be increased and the reproduction organ would be resumed properly. Therefore, it was an important reason to apply this kind of formula, in any type such as pasta, block, or powder (in this research, yeast was used instead) for lactating ruminants, including dairy goat so that it would increase milk production and milk quality such as milk fatty acid.

Milk production nationally has been an issue since it is only fulfilling about one fourth of milk demand, while the rest (76.27%) should be imported (DGLAH 2011). Supposed, there is a potential milk production derived from dairy goat 0.05%/yr, with a surprisingly high price of goat milk ($3/kg), in time of this research in Bogor, there would be a potential income for about $501,000/yr. Besides, milk quality, especially fatty acid content need to be addressed for healthy reason. Saturated fat, short, and medium chain fat are some types of fat in milk that might be of concern. However, most researches found that those were not as atherogenic as high consumption of low fat and high carbohydrate.

In order to improve milk production and milk fatty acid especially in dairy goat with advancing phase of lactation (about 4.6 months), there had been done three consecutive experiments. First was assessing nutrition performance of concentrate containing polyunsaturated fatty acid (PUFA) sources (corn oil, roasted ground corn, and roasted soybean meal) supplemented with yeast and curcuma during 2-6 weeks of storage. Second was *in vitro* ruminal fermentation of PUFA- diets supplemented with yeast and curcuma. Third was *in vivo* application of PUFA- diets supplemented with yeast and curcuma in late lactation dairy goat.

During 6 weeks of storage, total PUFA contents were lower than that of in 2 weeks, while moisture contents were up, therefore other nutrients such as dry matter, organic matter, crude fiber, N-free extract, ADF, ether extract, crude protein, and gross energy were slightly down. The PUFA-concentrate supplemented with yeast and curcuma (PCM) was able to maintain unsaturated fat and atherogenicity in the diet. It can be inferred that PUFA-concentrate supplemented with 0.5% yeast and 2% curcuma was nutritionally reasonable after 6 weeks of storage.

These PUFA- concentrates were then reformulated with on farm feedstuff that was used to fed the PE dairy goats; the by product from tofu industry, soybean seed, then mentioned as soybean by product. These concentrates were analyzed *in vitro* to evaluate their ruminal fermentation performance and at the same time they were evaluated *in vivo*.
It was analyzed that PUFA- diet with a mixture of yeast and curcuma additives was considered the most potential diet since it showed low protozoa population and high VFA production in the goat rumen fluid, eventhough it showed the lowest organic and dry matter digestibilities as well as N- NH3.

This mix PUFA- diet was also considered reasonable as it showed a better recovery in milk yield post treatment with progressing lactation in dairy goat. It showed some tendencies of higher lactose and Ca percentages; lower milk fat, 4% FCM, and SCC; higher Hb, PCV, and glucose but lower Prolactin in blood; higher ether extract intakes and Ca digestibility, supported by relatively high nutrient digestibility in most nutrients. Some consistencies were also found in this PUFA-diet, there were high in total fatty acid, medium chain fatty acid, long chain fatty acid, monounsaturated fatty acid, and PUFA; while it was low in SCFA, unsaturated fatty acid, and n6/n3 ratio, and atherogenicity index.

Milk for human consumption should comply with some standards such as fat (at least 3%), protein (at least 2.7%), lactose (at least 4.2%) according to SNI; ratio of n6/n3 (5:1 to 10:1) according to WHO; atherogenic index less than 3 (Bouattour et al. 2008); and SCC of 7.5 $10^5$ cells/ml (IDF 1999). The milk produced by PE dairy goat in late lactation fed with PUFA-diet supplemented with a combination of 0.5% yeast and 2% C. xanthorrhiza Roxb was falling around these standards and the goat showed stable persistency of milk production.

It has approved that supplementation of yeast only would increase milk production; curcuma only would modify fatty acid content of milk; whereas these combination could improve milk production and milk fatty acid content with progressing lactation.

These qualities were optimally considered good in terms of healthier product. Therefore, the PUFA- diet with 0.5% yeast and 2% curcuma was a reasonable choice to be applied for dairy goat.