CHAPTER 6 CONCLUSION

6.1 Experiment I.: Effect of drying methods on rice quality

The newly harvested ‘Suphan Buri 1’ paddy was re-wetted to the moisture content (MC) of 26 and 28% (wet basic) and dried by 2 drying methods.

1. The sun drying with the temperature of 38–40°C was performed for 6 or 8 h for the 26% and 28% MC, respectively, to achieve 12–13% MC. In the case of hot air oven drying at 60°C, the paddy with 26% MC took for 7 h and 28% MC was for 8 h.

2. The sun drying revealed slightly higher head yield of brown and milled rice compared to the oven drying. The chalky, cracked and defect grains were less than 1% in both drying methods.

3. The paddy with the 26% MC exhibited greater head yield of brown and milled rice compared to the MC of 28%. The imperfect grains were below 1% in both MC levels.

4. The brightness and yellowness – indicated by the CIE colour system – of paddy, brown and milled rice were not obviously affected by drying methods and the initial MC.

5. The amylose content was significantly reduced in the paddy with MC of 26% + oven drying.

6 The cooking quality in terms of elongation ratio, water absorption, hardness and stickiness were not significantly influenced by drying and MC.

6.2 Experiment II.: Effects of storage times on rice quality of ‘Suphan Buri 1’

The newly harvested ‘Suphan Buri 1’ paddy (2 kg) and milled rice (1 kg) were put in sealed PE (polyethylene) bags and stored at ambient temperature (30±2°C) for 6 months. Their qualities were analyzed every 2 months.

1. The colour of ‘Suphan Buri 1’ paddy and brown rice changed to brown yellow indicated by the lower L* value and high b* value after 4 months of storage. However, the colour of paddy and brown rice slightly changed after 6 months. On the other hand, the colour of milled rice from stored paddy was slightly changed less than stored milled rice indicated by the lower b* value.

2. The head yield and imperfect (chalky and defect) grains from stored paddy slightly reduced after 4 months of storage compared to stored milled rice. The amylose content increased from 28.87 to 32.42%. Moreover, the cooking qualities such as elongation ratio and water absorption were slightly increased; better hardness and less stickiness of cooked rice were observed.

3. The physical properties of stored milled rice were not clearly found during 4 – 6 months but the constant quality of cooked rice was found after 2 months. The amylose content gradually increased to 32.30% after storage for 6 months.

4. Our results suggest that the quality changes were affected by the form of rice during storage. The stability of the quality of milled rice from the stored paddy could be obtained after 6 months whereas the stored milled rice took only 4 months.

6.3 Experiment III: Quality of ‘KDML 105’ and ‘Suphan Buri 1’ as affected by high temperature treatment

The ‘KDML105’ and ‘Suphanburi 1’ milled rice was packed in sealed aluminum foil bags for 1.5 kg per bag. They were placed in an incubator at 45°C for 1 month during April to May, 2012.

1. The initial moisture content of the paddy was 10.3% for ‘KDML 105’ and 8.8% for ‘Suphan Buri 1’ and it was reduced to 9.7 and 7.4, respectively.

2. The L* value (lightness) value of the stored paddy, brown and milled rice of both cultivars were not significant different compared to their original value. However, the a* value (red) value of paddy, brown and milled rice of ‘KDML 105’ were significantly increased compared to ‘Suphan Buri 1’. The b* value (yellowness) and hue angle of paddy was significantly increased and the paddy presented obviously yellow for both cultivars. The brown and milled rice exhibited slightly yellow compared to the initial colour.

3. The head yield of brown rice of both cultivars was increased. However, the whole grains, chalkiness of milled rice were reduced after high temperature treatment. On the other hand, the kernel dimension was not significantly changed.

4. The amylose content and cooking quality (elongation ratio, water absorption) of both cultivars were increased. The hardness evaluated by a texture analyzer was increased but the stickiness was reduced in both cultivars.

5. In conclusion, the quality changes for both rice cultivars were similar and the heat treatment at 45°C for 1 month was able to induce rice quality.