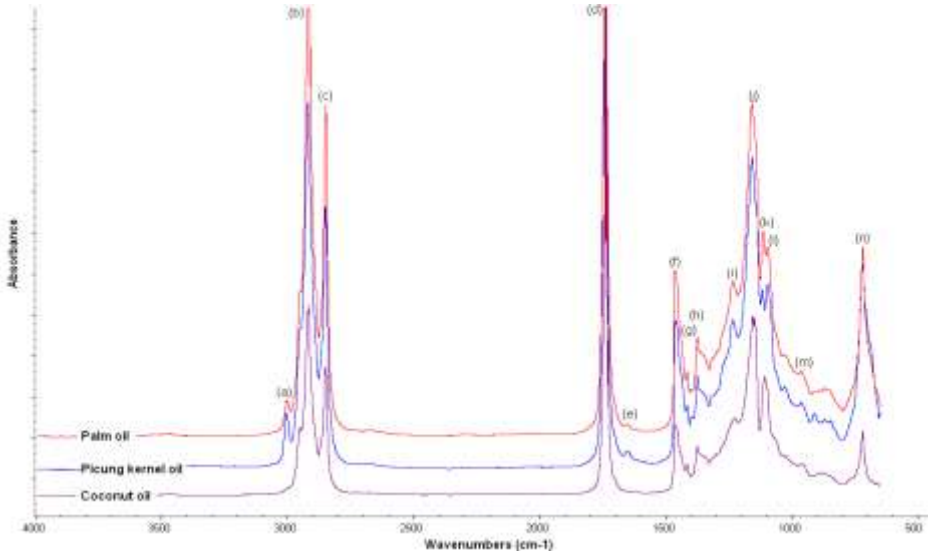

Figure 1. FTIR spectra of picung kernel, palm, and coconut oil

Upon a closer scrutiny, PKO is resemble PO rather than CO. PKO has major unsaturated and saturated fatty acids which are the same with PO, especially oleic (C18:1), linoleic (C18:2), palmitic (C16:0), and stearic acids (C18:0), as determined using gas chromatography (Table 3.). Differences between PKO and PO to CO are observed at several different spectra. CO didn't show spectrals at region at 3005.4/cm (a) which is due to the cis C=CH stretching, at 1655/cm (e) caused by cis C=C, and at 1116 and 1097/cm (k and l) corresponding to CH bending vibration and CH deformation vibration on fatty acids. This result is similar to Rohman and Che Man [10], differences spectra between palm and virgin coconut oil. PKO and PO contain more unsaturated fatty acids than CO, especially linoleic (C18:2) and oleic acid (C18:1). The presence of unsaturated fatty acid was observed in its FTIR spectrum at 3005.4/cm, which is absent in CO spectrum.

Table 4. Functional groups and modes of vibration in picung kernel, palm, and coconut oil spectra

Assigment	Frequency (/cm)	Functional group vibration
(a)	3005	*cis* C=CH stretching
(b)	2952	Asymmetric stretching vibration of methyl (-CH_3) group
(c)	2852	Asymmectric or symmetric stretching vibration of methylene (-CH_2) band
(d)	1747	Carbonyl (C=O) functional group from the ester linkage of triacylglycerol
(e)	1655	*Cis* C=C
(f)	1465	Bending vibrations of CH_2 group
(g)	1418	Rocking vibrations of CH bond of cis-disubsituted alkenes
(h)	1377	Symmetric bending vibrations of CH_3 groups
(i)	1236	Vibrations of stretching mode from the C-O group in esters
(j)	1160	Vibrations of stretching mode from the C-O group in esters
(k) and (l)	1116 and 1097	-CH bending and –CH deformation vibrations of fatty acids
(m)	962	Bending vibration of CH functional group of isolated trans-olefin
(n)	722	Overlapping of the methylene (-CH2) rocking vibration and to the out of plane vibration of cis-disubstituted olefins

Source : [10,18,20]

4. Conclusion

Crude PKO has chemical properties such as acid value 16.64, saponification value 126.44, iodine value 111.49, and peroxide value 8.539. This study showed that fatty acid composition of PKO is rich in oleic and linoleic acid, and the oil can be classified as unsaturated oil. The presence of high amount of linoleic acid suggest that these oil could be used as a good source of essential fatty acid. The high percentage of oleic, refined PKO might be used as edible cooking oil. Thus, the characteristic of saturated fatty acids

seems to explain the fat's suitability to the formulation of margarine and cocoa butter. FTIR spectra also showed that PKO resembled PO rather than CO.

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