Evaluation and application potential of an accelerometer-based collar device for measuring grazing behavior of dairy cows

J. Werner, C. Umstatter, L. Leso, E. Kennedy, A. Geoghegan, L. Shalloo, M. Schick, B. O’Brien

animal

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**Supplementary Material 1 (S1)**

############################

##### loading packages #####

require(epiR)

citation(package="epiR")

require(BlandAltmanLeh)

citation(package="BlandAltmanLeh")

require(hydroGOF)

citation(package="hydroGOF")

require(MethComp)

citation(package="MethComp")

require(nortest)

citation(package="nortest")

setwd("D://Teagasc\_Work//Jessica//Experiments//DF//Validation\_MM\_final\_DF")

getwd()

#################### ##### MMvsVis ######

#### CREATING DFs

DF\_MM\_Valid\_15Min <-read.table("DF\_MM\_Valid\_15Min.csv", header=TRUE, sep=",", dec=".")

str(DF\_MM\_Valid\_15Min)

##### RW vs MM\_15Min #######

### RumiTime ###

attach(DF\_MM\_Valid\_15Min)

cor.test(Ruminating,Rumination\_MM)

cor.test(Ruminating,Rumination\_MM,method="spearman", exact=FALSE)

epi.ccc(Ruminating,Rumination\_MM, ci = "z-transform", conf.level = 0.95)

bland.altman.plot(Ruminating,Rumination\_MM, two = 1.96, mode = 2,

graph.sys = "base", conf.int = 0.95, silent = FALSE, sunflower = FALSE,

geom\_count = FALSE)

### Feeding####

str(DF\_MM\_Valid\_15Min)

attach(DF\_MM\_Valid\_15Min)

cor.test(Grazing, Feeding\_MM,method="spearman", exact=FALSE)

epi.ccc(Grazing, Feeding\_MM, ci = "z-transform", conf.level = 0.95)

bland.altman.plot(Grazing, Feeding\_MM, two = 1.96, mode = 2,

graph.sys = "base", conf.int = 0.95, silent = FALSE, sunflower = FALSE,

geom\_count = FALSE)

detach(DF\_MM\_Valid\_15Min)

##### RW vs MM\_1h #######

### RumiTime ###

DF\_MM\_Valid\_1h <-read.table("DF\_MM\_Valid\_1hour.csv", header=TRUE, sep=",", dec=".")

attach(DF\_MM\_Valid\_1h)

str(DF\_MM\_Valid\_1h)

cor.test(Ruminating,Rumination\_MM)

cor.test(Ruminating,Rumination\_MM,method="spearman", exact=FALSE)

epi.ccc(Ruminating,Rumination\_MM, ci = "z-transform", conf.level = 0.95)

bland.altman.plot(Ruminating,Rumination\_MM, two = 1.96, mode = 2,

graph.sys = "base", conf.int = 0.95, silent = FALSE, sunflower = FALSE,

geom\_count = FALSE)

### Feeding####

str(DF\_MM\_Valid\_1h)

attach(DF\_MM\_Valid\_1h)

cor.test(Grazing, Feeding\_MM,method="spearman", exact=FALSE)

epi.ccc(Grazing, Feeding\_MM, ci = "z-transform", conf.level = 0.95)

bland.altman.plot(Grazing, Feeding\_MM, two = 1.96, mode = 2,

graph.sys = "base", conf.int = 0.95, silent = FALSE, sunflower = FALSE,

geom\_count = FALSE)

detach(DF\_MM\_Valid\_1h)

**Supplementary Material 2 (S2)**

############################

##### loading packages #####

require(epiR)

citation(package="epiR")

require(BlandAltmanLeh)

citation(package="BlandAltmanLeh")

require(hydroGOF)

citation(package="hydroGOF")

require(MethComp)

citation(package="MethComp")

require(nortest)

citation(package="nortest")

#### CREATING DFs

########## 30Min\_MM\_vs\_RW ##########

#HOME PC/INTENSO

setwd("D://Teagasc\_Work//Jessica//Experiments//MM\_Validation//2nd\_period\_autumn")

getwd()

#### CREATING DFs

DF\_MM\_30 <-read.table("Dataset30Min.csv", header=TRUE, sep=",", dec=".")

attach (DF\_MM\_30)

str(DF\_MM\_30)

### Test for normality with Anderson-Darling test for normality ###

library(nortest)

ad.test (RUMINATETIME)

ad.test (EAT1TIME)

ad.test (EATTIME )

#### Spearmans Rank correlation ###

###Feeding###

cor.test(EAT1TIME, FEEDING,method="spearman", exact=FALSE)

cor.test(EATTIME, FEEDING,method="spearman", exact=FALSE)

###Rumination###

cor.test(RUMINATETIME, RUMUNATION,method="spearman", exact=FALSE)

##### Concordance Correlation Coefficient####

epi.ccc(RUMINATETIME, RUMUNATION, ci = "z-transform", conf.level = 0.95)

epi.ccc(EAT1TIME, FEEDING, ci = "z-transform", conf.level = 0.95)

epi.ccc(EATTIME, FEEDING, ci = "z-transform", conf.level = 0.95)

detach (DF\_MM\_30)

setwd("D://Teagasc\_Work//Jessica//Experiments//DF//Validation\_MM\_final\_DF")

getwd()

########## DAILY\_MM\_vs\_RW ##########

DF\_MM\_24 <-read.table("DF\_MM\_RW\_Daily.csv", header=TRUE, sep=",", dec=".")

attach (DF\_MM\_24)

str(DF\_MM\_24)

### Test for Shapiro-Wilk Normality Test

shapiro.test(DIFF\_RUMI)

shapiro.test (DIFF\_EAT1)

shapiro.test (DIFF\_EAT)

shapiro.test(EATTIME)

shapiro.test (EAT1TIME)

shapiro.test (RUMINATETIME)

shapiro.test(FEEDING)

shapiro.test (RUMUNATION)

##### PEARSON'S R####

###Feeding###

cor.test(EAT1TIME, FEEDING)

cor.test(EATTIME, FEEDING)

###Rumination###

cor.test(RUMINATETIME, RUMUNATION)

##### Concordance Correlation Coefficient####

epi.ccc(RUMINATETIME, RUMUNATION, ci = "z-transform", conf.level = 0.95)

epi.ccc(EAT1TIME, FEEDING, ci = "z-transform", conf.level = 0.95)

epi.ccc(EATTIME, FEEDING, ci = "z-transform", conf.level = 0.95)

bland.altman.plot(EATTIME, FEEDING, two = 1.96, mode = 2,

graph.sys = "base", conf.int = 0.95, silent = FALSE, sunflower = FALSE,

geom\_count = FALSE)

detach(DF\_MM\_24)